ORDER NO. MKE0111000C1

B3

Service Manual

Video Cassette Recorder

Omnivision VHS

PV-V402 / PV-V4022 / PV-V4522 / PV-V4612

SPECIFICATIONS

ITEM	SPECIFICATION	1	2	3
Power	Source: 120 V AC±12 V AC, 60 Hz±3 Hz	○	○	○
	Consumption: Approx. 18 W (Power on), Approx. 2.5 W (Power off)	○	–	–
	Approx. 23 W (Power on), Approx. 3.0 W (Power off)	–	○	○
Video	Head: 4 rotary heads helical scanning system	○	○	○
	Input Level: VIDEO IN Jack (Phono type) 1.0 Vp-p 75 Ω unbalanced Output Level: VIDEO OUT Jack (Phono type) 1.0 Vp-p 75 Ω unbalanced Signal-to-Noise Ratio: SP: more than 43 dB LP/SLP: more than 41 dB Horizontal Resolution: Color/Monochrome: more: SP: 230 lines LP/SLP: 220 lines	○	○	○
Audio	Head: Normal Mono: 1 stationary head	○	○	○
	Hi-Fi Stereo: 2 rotary heads	–	○	○
	Input Level: AUDIO IN Jack (Phono type) -10 dBv 50 kΩ unbalanced	○	○	○
	Output Level: AUDIO OUT Jack (Phono type) -8 dBv 600 Ω unbalanced	○	–	–
	AUDIO OUT Jack (Phono type) -8 dBv 1 kΩ unbalanced	–	○	○
	Frequency Response: Normal Mono: SP: 100 Hz-8 kHz	○	○	○
	LP: 100 Hz-6 kHz	○	○	○
	SLP: 100 Hz-5 kHz	○	○	○
	Hi-Fi Stereo: SP/LP/SLP: 20 Hz-20 kHz	–	○	○
	Signal-to-Noise Ratio: Normal Mono: SP: more than 42 dB	○	○	○
	LP/SLP: more than 40 dB	○	○	○
	Hi-Fi Stereo: SP/LP/SLP: more than 60 dB	–	○	○
	Wow and Flutter: Normal Mono: SP: Less than 0.2 % WRMS	○	○	○
	LP: Less than 0.3 % WRMS	○	○	○
	SLP: Less than 0.4 % WRMS	○	○	○
	Hi-Fi Stereo: Less than 0.015 % WRMS	–	○	○

ITEM	SPECIFICATION	1	2	3
RF Out	CH 3/CH 4 switchable 72 dBμ (open voltage) 75 Ω unbalanced	○	○	○
Tuner	Broadcast Channels: VHF 2~13, UHF 14~69 CABLE Channels: Midband A through I (14~22) Superband J through W (23~36) Hyperband AA~EEE (37~64) Lowband A-5~A-1 (95~99) Special CABLE channel 5A (01) Ultraband 65~94, 100~125	○	○	○
Video Signal	EIA Standard (525 lines, 60 fields) NTSC Color Signal	○	○	○
Tape Speed	SP: 1-5/16 i.p.s (33.35 mm/s), LP: 21/32 i.p.s (16.67 mm/s), SLP: 7/16 i.p.s (11.12 mm/s) Record/Playback Time: 8 hr. with 160 min. type tape used in SLP mode FF/REW Time: Less than 2-1/2 min. (120 min. type tape) *Note: FF/REW Time may be exceed specification according to tape condition.	○	○	○
Tape Format	Tape width 12.7 mm (1/2 inch) high density tape	○	○	○
Operating Condition	5 °C-40 °C (41 °F-104 °F) (Temperature) 10 %-75 % (Humidity)	○	○	○
Dimension (W x H x D)	360 mm x 93 mm x 242 mm (14-3/16 inch x 3-11/16 inch x 9-9/16 inch)	○	○	–
	430 mm x 98 mm x 242 mm (16-15/16 inch x 3-7/8 inch x 9-9/16 inch)	–	–	○
Weight	2.5 kg (5.5 lbs.)	○	○	–
	2.7 kg (6.0 lbs.)	–	–	○

1. PV-V402/PV-V4022
2. PV-V4522
3. PV-V4612

Weight and dimensions shown are approximate.
Designs and specifications are subject to change without notice.

Panasonic®

1. SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

2. An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing.

3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.

4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.

5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.

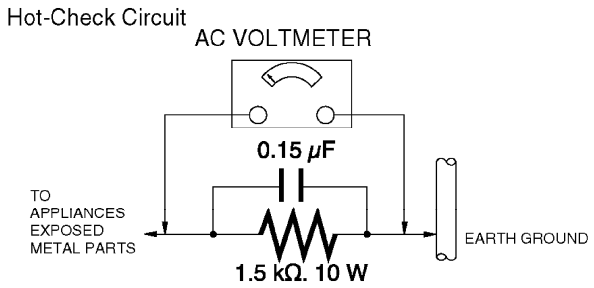
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the

equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1 M Ω and 5.2 M Ω . When the exposed metal does not have a return path to the chassis, the reading must be infinity.

LEAKAGE CURRENT HOT CHECK
(See figure 1.)

1. **Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.**
2. **Connect a 1.5 k Ω , 10 W resistor, in parallel with a 0.15 μ F capacitor, between each exposed metallic part on the set and a good earth ground, as shown in figure 1.**
3. **Use an AC voltmeter, with 1 k Ω /V or more sensitivity, to measure the potential across the resistor.**
4. **Check each exposed metallic part, and measure the voltage at each point.**
5. **Reverse the AC plug in the AC outlet and repeat each of the above measurements.**
6. **The potential at any point should not exceed 0.75 V RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks. Leakage current must not exceed 1/2 mA. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.**

Figure 1



2. PREVENTION OF ELECTRO-STATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits, some field-effect transistors and semiconductor "chip" components.

The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. **Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should remove electrostatic charge for potential shock reasons prior to applying power to the unit under test.**
2. **After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.**
3. **Use only a grounded-tip soldering iron to solder or unsolder ES devices.**
4. **Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate electrical charge sufficient to damage ES devices.**
5. **Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.**
6. **Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).**
7. **Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.**
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. **Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).**

"NOTE to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical."

3. OPERATION GUIDE

4. SERVICE NOTES (PLEASE READ)

4.1. SERVICE NOTES

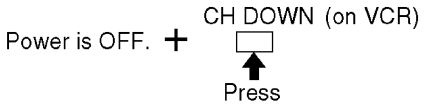
4.1.1. SIMPLIFIED FAULT FINDING DATA

implified Self-Diagnostic System facilitates finding the cause of the fault. A 3-digit fault code will be displayed in F.I.P.

The Simplified Fault finding data is stored in the Memory IC (IC6005). This data is cleared after it is displayed, and then the POWER button is pressed back on.

1. With power turned off, press CH DOWN button on VCR (for over 3 seconds if VCR is not in shut off condition).

Fig. 1-1



2. Fault code (3-digit number) will be displayed in F.I.P. as shown.

Fig. 1-2

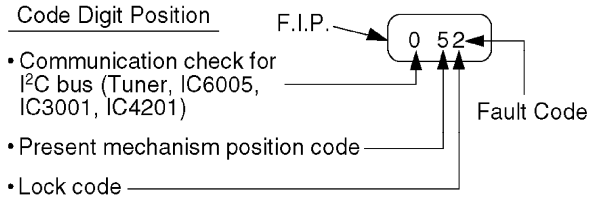


Fig. 1-3

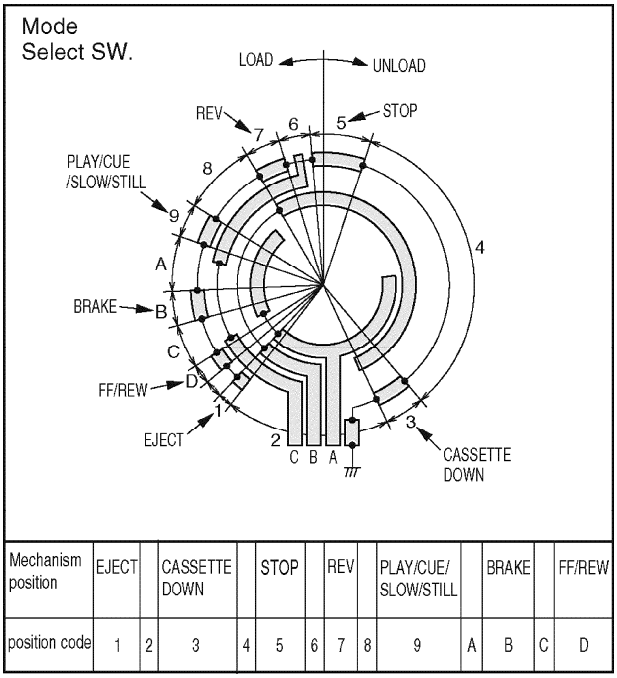
Explanation of Codes	Code No.		
Communication check for I²C bus (Tuner, IC6005, IC3001, IC4201) (Refer to Fig. 1-4.)	0 ~ F		
Present Mechanism Position Code Mechanism Position is indicated. (Refer to Fig. 1-5.)		1 2 3 4 5 6 7 8 9 A B C D	
Lock Code (See Note) • VCR is not in shut-off condition. • Reel lock. • Cylinder lock. • Exceeds loading/unloading time. (Mechanism Lock) • Exceeds Cassette loading/unloading time. (Cassette Lock)			0 1 2 3 4

Fig. 1-4

Communication check for I²C bus (IC6001↔Tuner)	Communication check for I²C bus (IC6001↔IC6005)	Communication check for I²C bus (IC6001↔IC3001)	Communication check for I²C bus (IC6001↔IC4201)	Code No.
OK	OK	OK	OK	0
			NG	1*
		NG	OK	2
			NG	3*
	NG	OK	OK	4
			NG	5*
		NG	OK	6
			NG	7*
NG	OK	OK	OK	8
			NG	9*
		NG	OK	A
			NG	b*
	NG	OK	OK	C
			NG	d*
		NG	OK	E
			NG	F*

Note:
For Normal Audio (Mono) models, ignore "Communication check for I²C bus (IC6001↔IC4201)" and odd code Nos. (those with*) will not be displayed in F.I.P.

Fig. 1-5



Mechanism position	EJECT		CASSETTE DOWN		STOP		REV		PLAY/CUE/ SLOW/STILL		BRAKE		FF/REW
position code	1	2	3	4	5	6	7	8	9	A	B	C	D

3. When 1 to 4 listed in Lock code occurs, Lock data will be stored in the Memory IC (latest Lock data only).

Note:

1. Lock data will be kept after the AC Cord is unplugged.

2. When 1 to 4 listed in Lock code occurs for the first time, the VCR does not go into VCR shut-off condition. If it occurs again within a minute, the VCR goes into VCR shut-off condition. Then, the VCR stops and all VCR function buttons except for power become non-operational.

3. Lock data will be cleared at the first power on operation after lock

code is displayed in FIP.

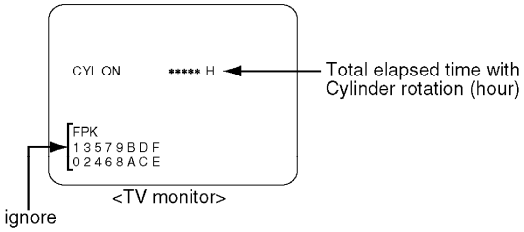
4.1.2. USAGE SCREEN MODE

Function displayed on the TV monitor:

- the total elapsed ”Cylinder rotation ”time (in hours)

1. With power turned on and no cassette, press CH DOWN button on VCR and 7 key on remote together.
(The USAGE SCREEN will be displayed on the TV Monitor.)

Fig. 2



Note:

1. After replacing the Cylinder Unit, press COUNTER RESET button on remote in this mode. Total elapsed "Cylinder rotation" time (in hours) will be cleared to 0.

2. To release from Usage Screen Mode, press any operation button on VCR or insert a cassette tape in this mode. The VCR will return to normal operation mode.

4.1.3. EEPROM IC (IC6005), MAIN C.B.A. REPLACEMENT NOTE

After replacing EEPROM IC (IC6005) or Main C.B.A., be sure to perform the "PG SHIFTER ADJUSTMENT" in ELECTRICAL ADJUSTMENT procedures.

4.1.4. SERVICE POSITION

4.1.4.1. Service Position

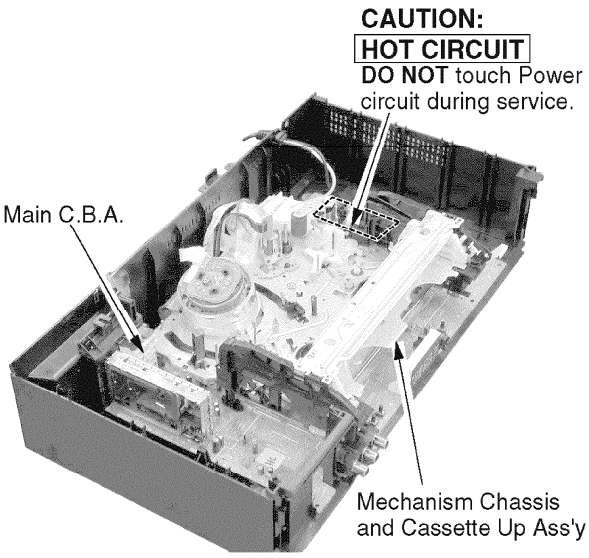
Service Position	Purpose
Service Position (1)	Mechanism check Mechanical adjustment Electrical adjustment
Service Position (2)	Main C.B.A. check

CAUTION:

HOT CIRCUIT (Primary circuit) exists on the Main C.B.A.
Use extreme care to prevent accidental shock when servicing.

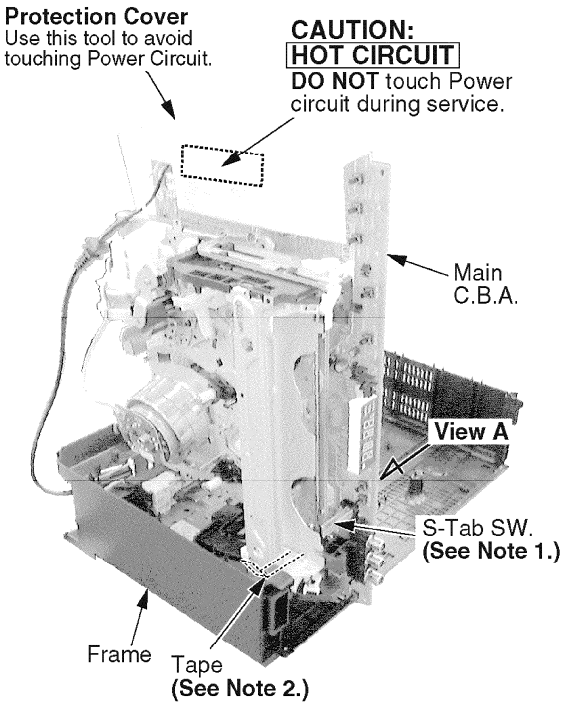
4.1.4.1.1. Service Position (1)

Fig. 3-1



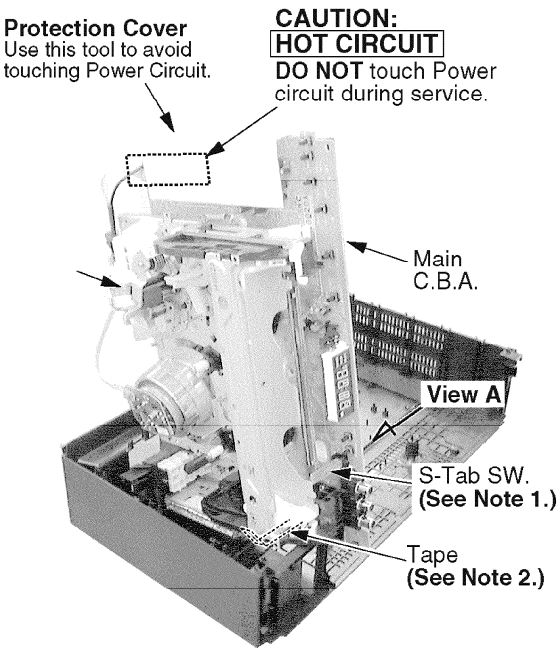
4.1.4.1.2. Service Position (2-1)
(Normal Frame Model)

Fig. 3-2-1



4.1.4.1.3. Service Position (2-2)
(Wide Frame Model)

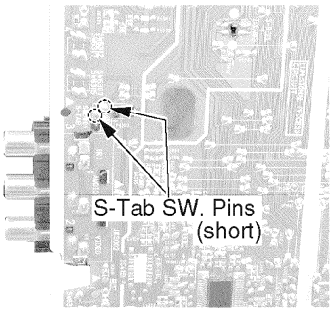
Fig. 3-2-2



Note:

1. **It is possible that the S-Tab SW. may not work correctly in Service Position (2-1), (2-2). (Recording can not be done). In this case, short the S-Tab SW. Pins on the foil side of the Main C.B.A. to turn this SW. on.**

Fig. 3-3



Main C.B.A. (foil side)
View A

Alternative method:
Cover the S-Tab SW. with masking tape.

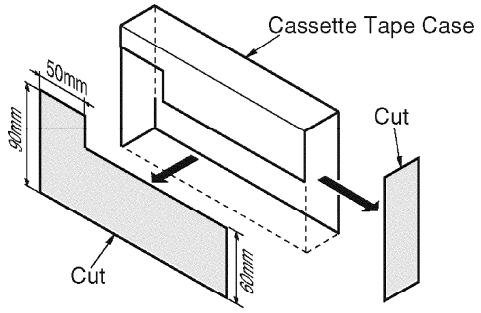
2. **Place the tape between the Cassette Up Ass'y and Main C.B.A. to get a stability.**
3. **When disassembling/assembling, refer to "CABINET SECTION" in DISASSEMBLY/ASSEMBLY PROCEDURES.**

Fig. 3-4

To avoid touching Power Circuit,
following Tool (**Protection Cover**) is recommended.

How to make the Protection Cover:

1. Cut a Cassette Tape Case as shown.



2. Cover the Power Circuit portion on Main C.B.A. with it.

Note:
The Protection Cover is not supplied.

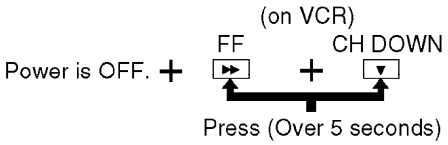
4.1.5. HOT CIRCUIT

Primary circuit exists on the Main C.B.A.
This circuit is identified as "HOT" on the C.B.A. and in the Service Manual. Use extreme care to prevent accidental shock when servicing.

4.1.6. SERVICE MODE

In order to inhibit detection of the Supply & Takeup Photo Transistors, Reel Sensor, and Cylinder Lock, press and hold FF button and CH DOWN buttons on VCR together over 5 seconds in power off condition.

Fig. 4-1

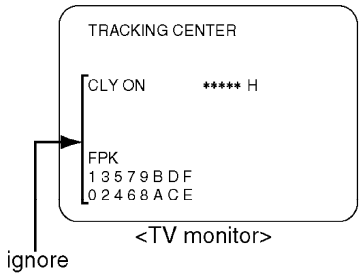


The power comes on and the unit goes into service mode.
In this mode, Mechanism movement can be confirmed. When removing Cassette Up Ass'y, it can be confirmed without a cassette.
To release from this mode, press POWER button off or disconnect AC Plug.

4.1.7. TRACKING CENTER MODE (TRACKING FIX AT CENTER)

Insert the Cassette tape. Set the unit into Service Mode. Play back the Cassette tape. Press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.
In this mode, the tracking is fixed at center. (Auto tracking and manual tracking functions are not operational.)

Fig. 4-2



To release from this mode, press PLAY or STOP button.

4.1.8. CAUTION FOR INSTALLATION OF FRONT PANEL ASS'Y

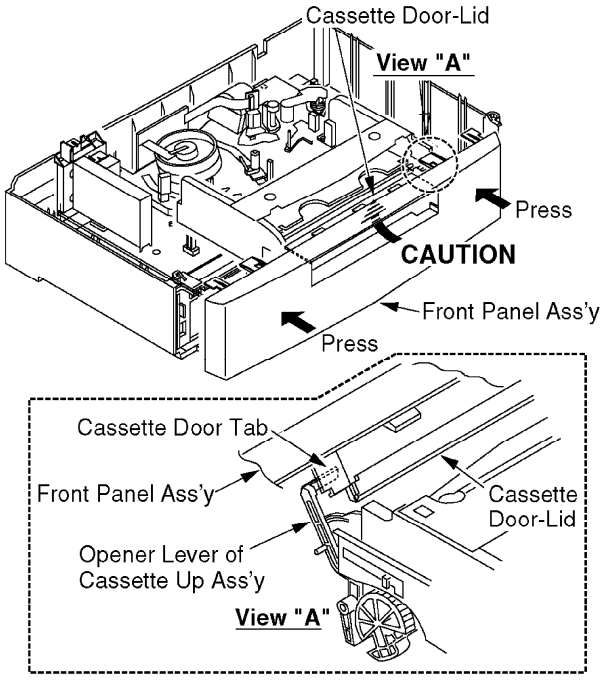
CAUTION:

Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener Lever of Cassette Up Ass'y set incorrectly.

Install the Front Panel Ass'y as follows:

1. **Swing the Cassette Door-Lid all the way open until the Cassette Door tab clears the Opener Lever.**
2. **Make sure that all locking tabs are aligned properly. Then, press the Front Panel straight in.**

Fig. 5



4.1.9. METHOD FOR LOADING/UNLOADING OF MECHANISM

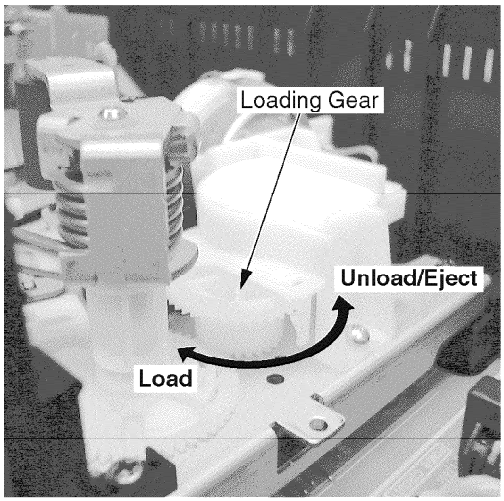
4.1.9.1. (Manual Method)

Turn the Loading Gear clockwise (for loading) or counterclockwise (for unloading) using needlenose pliers etc.

Note:

Do not use this method if Mechanism is jammed or locked.

Fig. 6-1



4.1.9.2. (Electrical Method)

Apply +10.0 V DC Power Supply to the Loading Motor terminals.

Loading

DC + to Portion "a," DC - to Portion "b"

Unloading

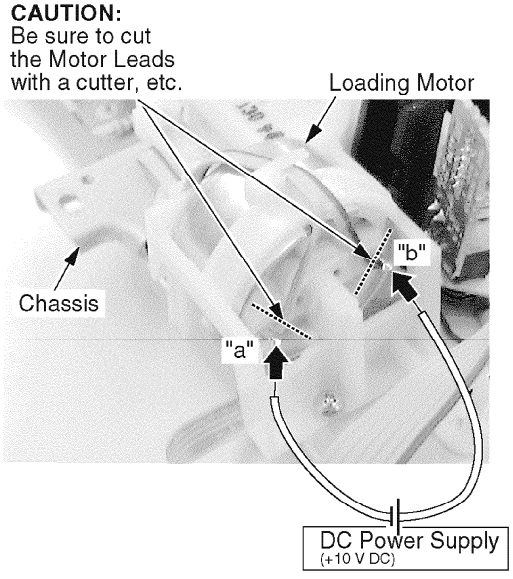
DC - to Portion "a," DC + to Portion "b"

CAUTION:

Before applying DC Power Supply, be sure to cut the Motor Leads with a cutter, etc.

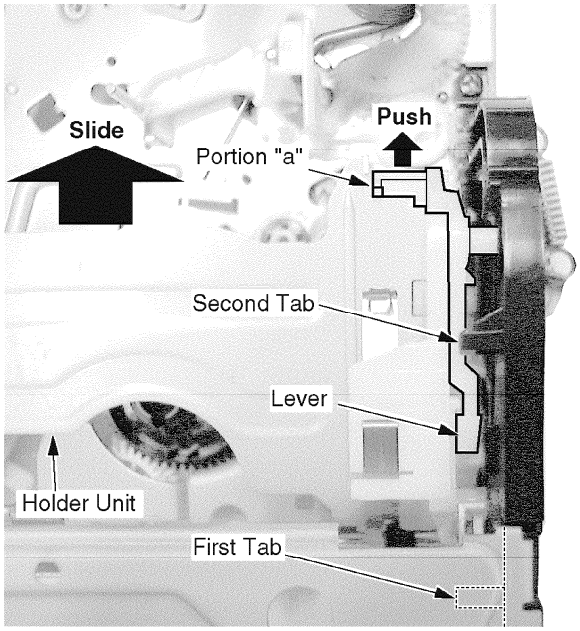
Otherwise, the Loading Motor Drive IC (IC2501) may be damaged.

Fig. 6-2



When loading without a cassette, push Portion "a" on the Holder Unit of Cassette Up Ass'y so that the Lever clear the First Tab and Second Tab.

Fig. 6-3



4.1.10. HOW TO REMOVE A JAMMED TAPE

CAUTION:

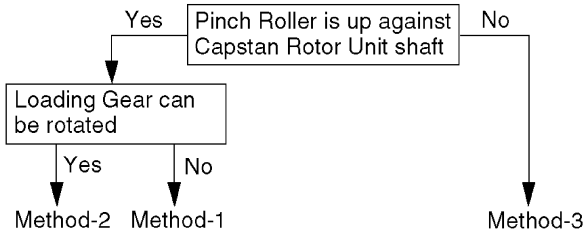
Wiper Arm Unit may be damaged or its spring may be out of place when the jammed tape is removed by force.

Remove a jammed tape as follows:

4.1.10.1. Manual Method

When a tape jam is encountered, check the tape loading condition and use the following procedure to remove a tape jam.

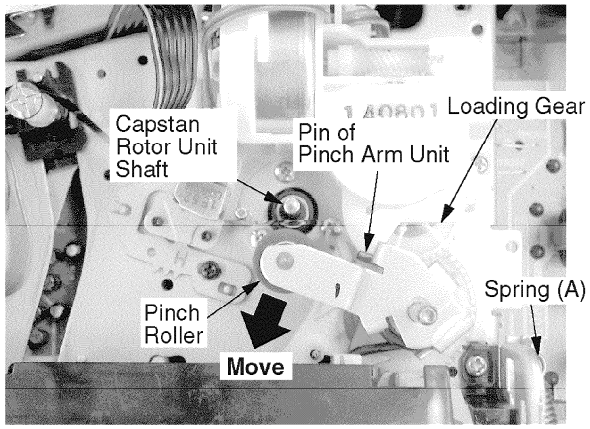
Fig. 7-1



Method -1:

1. Move the Pinch Roller Unit out by unhooking the Pin of Pinch Arm Unit so that the Pinch Roller is separated from the Capstan Rotor Unit shaft.

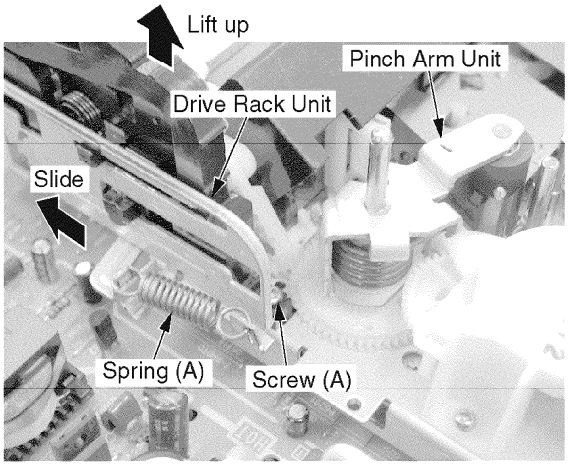
Fig. 7-2



Top View

2. Remove the tape from the tape path.
3. Rewind the tape into the cassette by rotating the Center Clutch Unit counterclockwise.
4. Unhook Spring (A) of the Drive Rack Arm.
5. Remove Screw (A).
6. Lift the Cassette Up Ass'y. While pulling the Cassette Up Ass'y out far enough so that it clears the Drive Rack Arm, slide the Drive Rack Unit as indicated by the arrow to remove the cassette tape from the Cassette Up Ass'y.
7. Check the cause of mechanical trouble and repair.

Fig. 7-3



Method -2:

1. Rotate Loading Motor counterclockwise with needlenose pliers, etc. so that the Pinch Roller is separated from the shaft of the Capstan Rotor Unit.
2. Perform Step 2 through Step 7 of Method -1.

Method -3:

1. Perform Step 2 through Step 7 of Method -1.

Note:

After repairing mechanical trouble, make sure that all gear alignments are correct, especially the Wiper Arm Unit and Drive Rack Unit of Cassette Up Ass'y. (Refer to "EJECT Position Confirmation" in DISASSEMBLY/ASSEMBLY PROCEDURES.)

4.1.10.2. Electrical Method

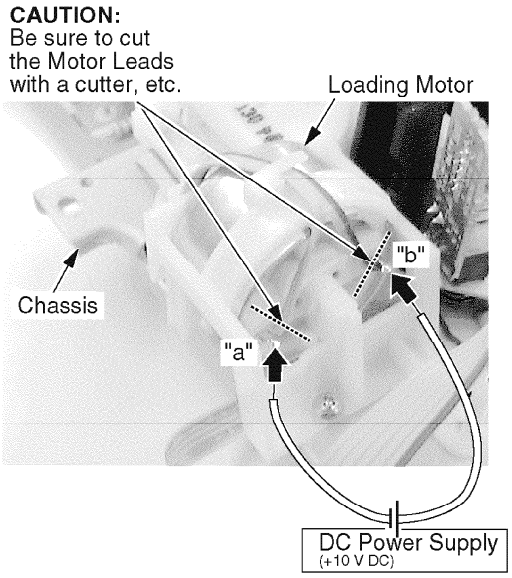
Electrical method can only be performed when the mechanism is moved by rotating the Loading Gear.

CAUTION:

1. **Before applying DC Power Supply, be sure to cut the Motor Leads with a cutter, etc.**
   Otherwise, the Loading Motor Drive IC (IC2501) may be damaged.
2. **If loading does not start in approx. 2 seconds after DC Power Supply is applied, DO NOT continue to apply DC Power Supply. Instead, perform "Manual Method."**

1. **Be sure to cut the Motor Leads with a cutter, etc.**
2. **Apply +10.0 V DC Power Supply to the Loading Motor terminals.**
3. **When the Loading Posts reach the fully unloaded position, remove the Power Supply.**

Fig. 8



4. **Rewind the tape into the cassette by turning the Center Clutch Unit counterclockwise.**

5. Eject the cassette by applying +10.0 V DC Power Supply again.

4.1.11. BLACK SCREWS ON THE CHASSIS

Black Screws are used on the Mechanism Chassis to identify screws that require adjustment.

4.1.12. HOW TO RESET ALL VCR MEMORY FUNCTIONS

To reset (clear) the select language, channel auto set and set clock functions to their initial power on condition (power on, no cassette inserted), hold down the PLAY and CH UP buttons on the unit together for more than 5 seconds.
Power will shut off.

4.1.13. HOW TO CONFIRM AUTO CLOCK SET FEATURE

1. Connect an RF cable from the output of one unit to the input of the test unit.

2. Select corresponding RF channels.

3. Playback a recording of P.B.S. channel including clock set data and confirm this feature.

4.1.14. VARIABLE VOLTAGE ISOLATION TRANSFORMER

An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing.
Also, when troubleshooting the above type of Power Supply Circuit, a variable isolation transformer is required in order to increase the input voltage slowly.

4.1.15. SPECIAL NOTE

All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this service manual.

4.1.16. MODEL NO. IDENTIFICATION MARK

Use Marks shown in the chart below to distinguish the different models included in this Service Manual.

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not Used	PT

Note:
Refer to Item 3 of Schematic Diagram Notes of Schematic Diagram Notes, for mark "PT."

5. DISASSEMBLY/ASSEMBLY PROCEDURES

5.1. CABINET SECTION

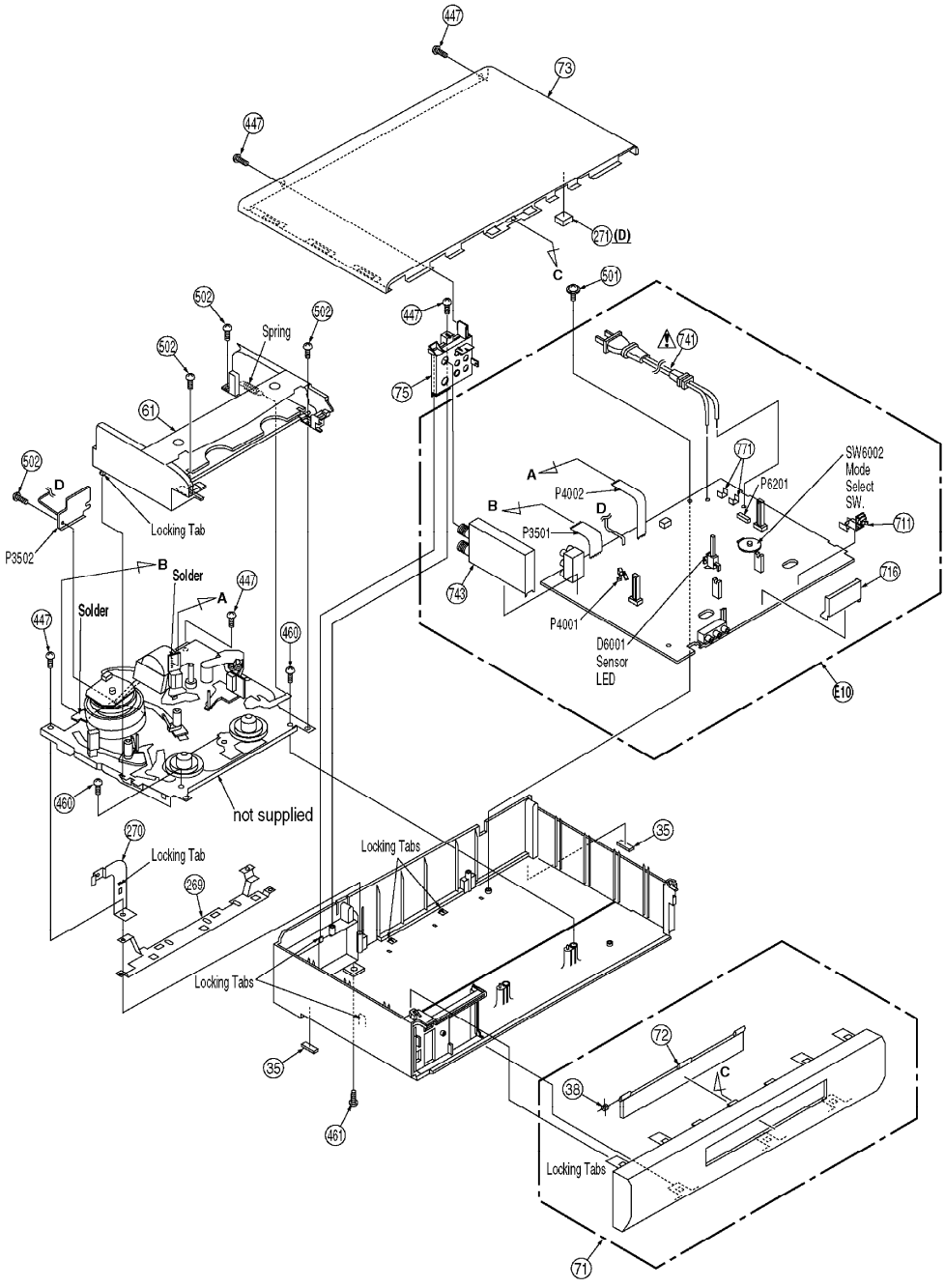
5.1.1. Disassembly Method

STEP No.	Ref. No.	PART	REMOVE	NOTE
1	(73)	Top Cover	Screws (447) 2pcs	1
2	(71)	Front Panel Ass'y	Locking Tabs of Front Panel	2
3	-	Main C.B.A. & Mechanism Chassis	Screws (461), (447) 3pcs, (501), (460) 2pcs, Locking Tabs, Grounding Plates ((269), (270)) *Operation C.B.A. (Screw (447), Locking Tab)	3
4	(E10) -	Main C.B.A. Mechanism Chassis	Screw (502), Shield Plate Unit (P3502), Mechanism Chassis (P4001, P6201), Unsolder Flat Cables on Cylinder and AC Head	4,5
5	(61)	Cassette Up Ass'y	Screws (502) 3pcs, Locking Tab, Spring	6

*Note:
Please refer to Exploded View and Parts List for applicable model.
Also, some models in the Service Manual may not use the part.

Figure

IMPORTANT SAFETY NOTICE
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.



5.1.2. Notes in chart

1. Installation of Top Cover
Install the Top Cover front portion at a downward angle so that the tab on the Front Panel Ass'y fits into the hole in the Top Cover.
Then, lower the rear portion into place and tighten 2 Screws (447).

2. Installation of Front Panel Ass'y

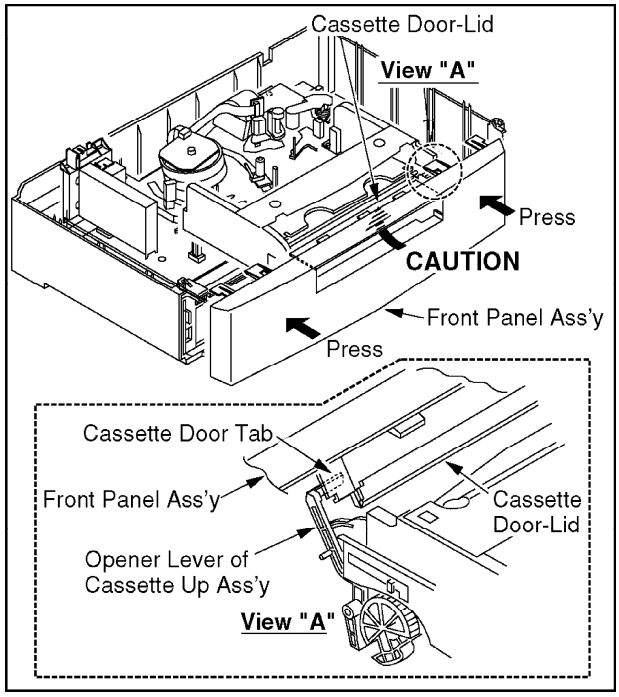
CAUTION:

Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener Lever of Cassette Up Ass'y set incorrectly.

A. When installing the Front Panel Ass'y, swing the Cassette Door-Lid all the way open until the Cassette Door tab clears the Opener Lever.

B. Make sure that all locking tabs are aligned properly. Then, press the Front Panel straight in.

Fig. D1

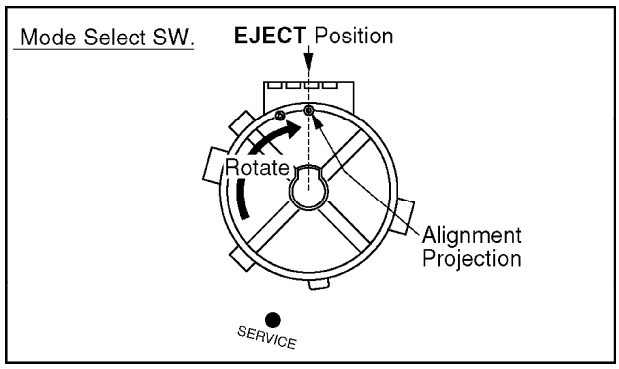


3. Installation of Main C.B.A. & Mechanism Chassis onto the Frame
When installing 2 Screws (460), slide the Holder Unit of the Cassette Up Ass'y (Refer to "METHOD FOR LOADING/UNLOADING OF MECHANISM" in Service Notes) to tighten screws. Then, slide it back to the EJECT Position.

4. Installation of Mechanism Chassis and Cassette Up Ass'y onto Main C.B.A.

A. Make sure the Mode Select SW. on the Main C.B.A. is in EJECT position. If not, rotate the Mode Select SW. until the alignment projection is in the EJECT Position.

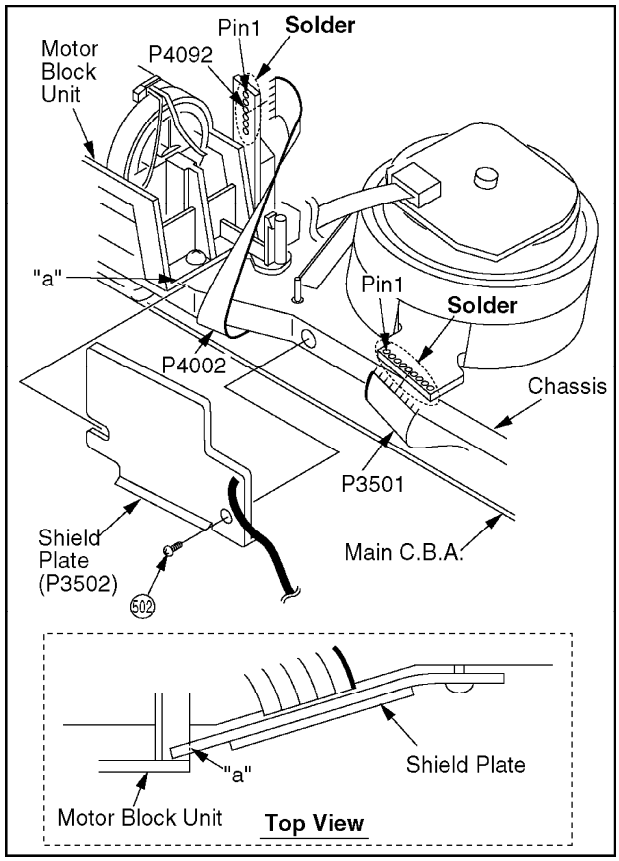
Fig. D2



B. Install the Mechanism Chassis and Cassette Up Ass'y straight onto the Main C.B.A. so that the Sensor LED clears the hole in the Mechanism Chassis and that 2 Connectors (P4001, P6201) are aligned and seated securely.

5. Flat Cable solder points on the Cylinder and AC Head
Solder the Flat Cables. Then, install the Shield Plate as shown.

Fig. D3



6. Installation of Cassette Up Ass'y

A. Confirm that the Locking Tab under the Cassette Up Ass'y is in Hole on the Mechanism Chassis when installing the Cassette Up Ass'y. Then, slide the Cassette Up Ass'y towards the back.

B. When installing 2 Screws (502), slide the Holder Unit (Refer to "

METHOD FOR LOADING/UNLOADING OF MECHANISM" in Service Notes) to tighten screws. Then, slide it back to the EJECT Position.

C. Hook Spring to the Drive Rack Arm on the Mechanism Chassis.

5.2. MECHANISM SECTION

5.2.1. Disassembly/Reassembly Method

This procedure starts with the condition that the cabinet parts and Main C.B.A. have been removed.
When reassembling, perform the step(s) in the reverse order.
Perform all disassembly/reassembly and alignments procedures in EJECT Position.

Step/Loc. No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	----------	Not used	-	-	
②	----------	Full Erase Head	J2	(L-1)	
③	1	Cylinder Unit	J2	3(S-3), Flexible Cable	TAPE INTERCHANGEABILITY Adjustment
④	----------	Capstan Belt	J3-1	-	
⑤	----------	Support Angle	J3-1	(S-4), (S-5)	
⑥	5	Intermediate Gear B	J3-1	(L-2)	Gear Alignment
⑦	4,5,6	Main Cam Gear	J3-1	Main Cam Push Nut	Gear Alignment
⑧	4	Center Clutch Unit	J4-1	(W-1)	
⑨	4,8	Changing Gear Spring	J4-1	-	
⑩	4,8,9	Changing Gear	J4-1	-	
⑪	4,8,9,10	Idler Arm Unit	J4-1	-	
⑫	----------	Reel Gear	J5-1	2(L-3)	
⑬	4,5,6,7,8,9,10	Main Rod	J5-1	(W-2), (L-4)	Gear Alignment
⑭	----------	Not used	-	-	
⑮	4	Capstan Motor Unit	J6	3(S-6), Unsolder	
⑯	----------	Not used	-	-	
⑰	----------	Not used	-	-	
⑱	----------	Not used	-	-	
⑲	4,8,9,10,13	T Loading Arm Unit	J7-1	-	Gear Alignment
⑳	4,5,6,7,8,9,10,13,19	S Loading Arm Unit	J7-1	-	Gear Alignment
㉑	----------	T Brake Unit	J8-1	-	
㉒	----------	Tension Control Arm Unit	J8-1	3(L-5)	
㉓	21	T Reel Table	J8-1	-	
㉔	22	S Reel Table	J8-1	-	
㉕	22	Tension Arm Unit	J8-1	2(L-6), (P-1), (P-2)	
㉖	22,25	Loading Post Base-T Unit	J9	-	P2 AND P3 POST HEIGHT, TAPE INTERCHANGEABILITY Adjustment
㉗	22,25	Loading Post Base-S Unit	J9	-	
㉘	----------	Opener Piece	J10-1	2(L-7)	
㉙	4,5,6,7	Drive Rack Arm	J10-1	-	
㉚	28	Pinch Arm Unit	J10-1	-	
㉛	28,30	P5 Arm Unit	J10-1	(W-3)	
㉜	5,6,28	Intermediate Gear A	J10-1	-	Gear Alignment
㉝	----------	Motor Block Unit	J11	2(S-9)	
㉞	----------	Audio Control Head Unit	J11	(S-10)	TAPE INTERCHANGEABILITY Adjustment
㉟	5,6,28,30,32,33	Lift Gear	J11	-	
㊱	----------	Not used	-	-	
㊲	22,25	Tension Arm Boss	J11	(L-8)	
㊳	----------	SS Brake Arm Unit	J5-1	(L-9), (P-3)	
㊴	----------	Cleaner Arm Unit **(Model with Cleaner Arm Unit)**	J11	(L-10)	

A B C D E F

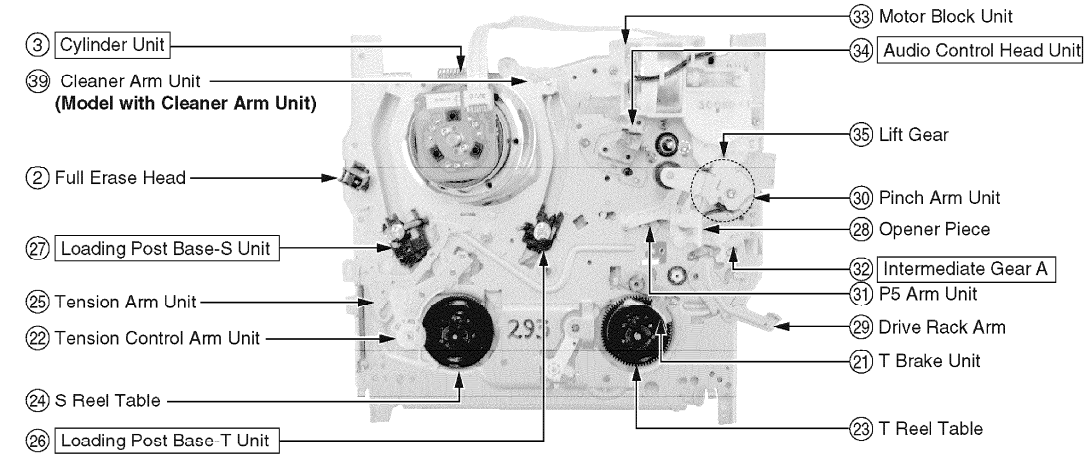
How to read chart shown above:
A: Order of Procedure steps.
When reassembling, perform steps(s) in reverse order.
These numbers are also used as the identification (location) No. of parts in Figures.
B: Steps to be completed prior to the current step.
C: Part to be removed or installed.
D: Fig. No. showing Procedure or Part Location.
E: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.
(S-1) = Screw (S-1), (L-1) = Locking Tab (L-1),
(W-1) = Washer (W-1), (P-1) = Spring (P-1),
(C-1) = Cut Washer (C-1)
F: Alignment/Adjustment which is required when installing or replacing each Parts.

5.2.2. Inner Parts Location

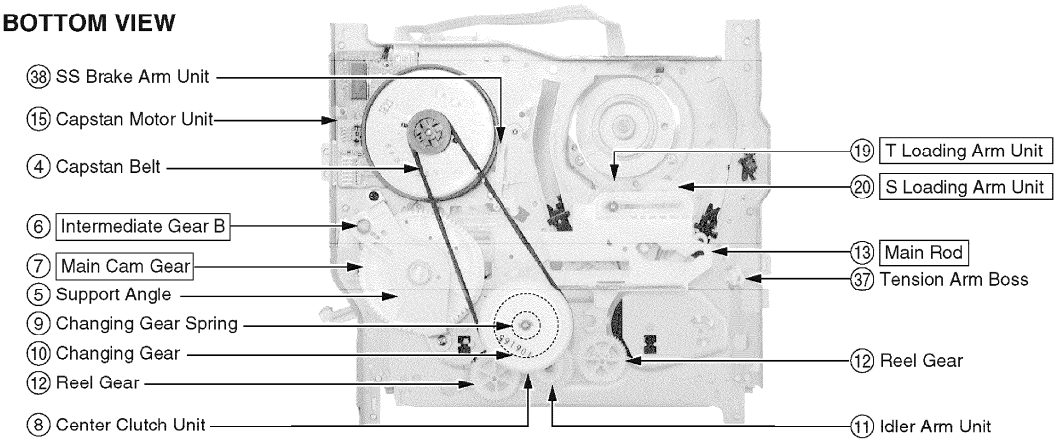
Note: BOX indicates alignment (Gear Alignment or Mechanical Adjustment) required when a part is replaced.

Fig. J1-1

TOP VIEW


③ Cylinder Unit
㊴ Cleaner Arm Unit
(Model with Cleaner Arm Unit)
② Full Erase Head
㉗ Loading Post Base-S Unit
㉕ Tension Arm Unit
㉒ Tension Control Arm Unit
㉔ S Reel Table
㉖ Loading Post Base-T Unit
㉝ Motor Block Unit
㉞ Audio Control Head Unit
㉟ Lift Gear
㉚ Pinch Arm Unit
㉘ Opener Piece
㉜ Intermediate Gear A
㉛ P5 Arm Unit
㉙ Drive Rack Arm
㉑ T Brake Unit
㉓ T Reel Table

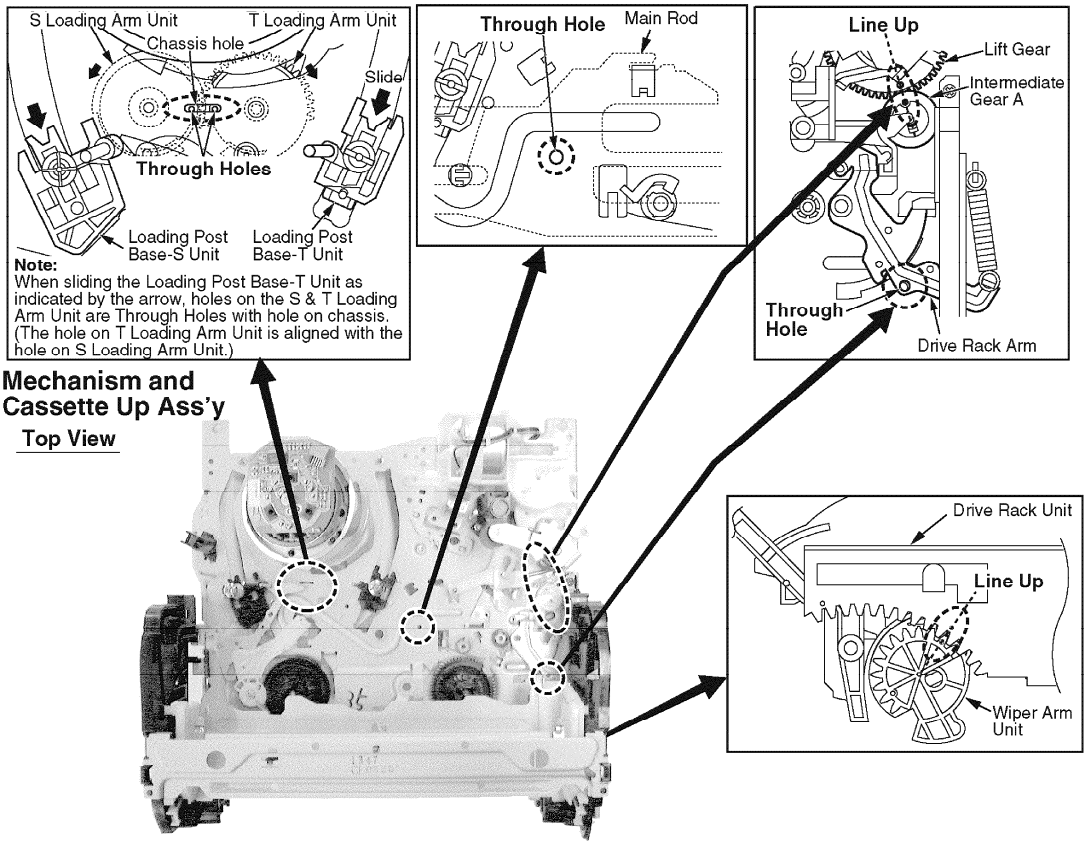
BOTTOM VIEW



5.2.3. EJECT Position Confirmation

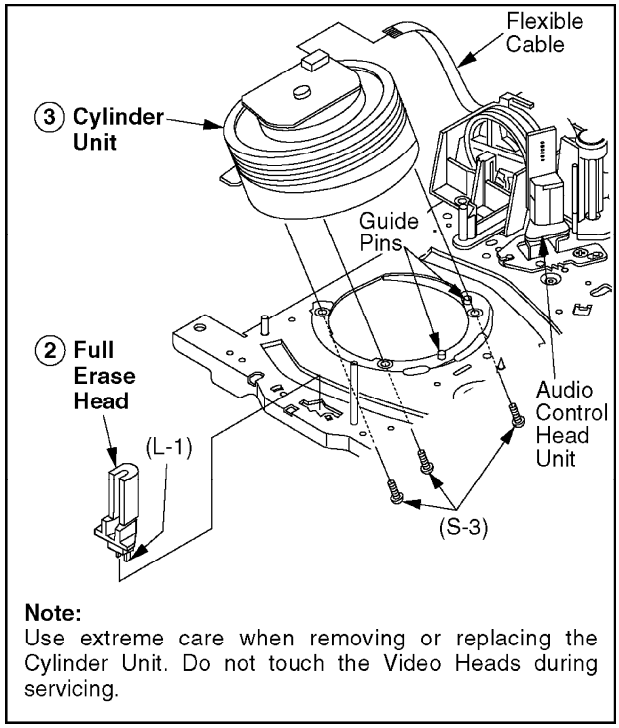
Fig. J1-2

Check the following alignment points to confirm that the Mechanism and Cassette Up Ass'y are in the **EJECT** Position from the top side.


S Loading Arm Unit
T Loading Arm Unit
Chassis hole
Slide
Through Holes
Loading Post Base-S Unit
Loading Post Base-T Unit
Note:
When sliding the Loading Post Base-T Unit as indicated by the arrow, holes on the S & T Loading Arm Unit are Through Holes with hole on chassis. (The hole on T Loading Arm Unit is aligned with the hole on S Loading Arm Unit.)
Through Hole
Main Rod
Line Up
Lift Gear
Intermediate Gear A
Through Hole
Drive Rack Arm
Mechanism and Cassette Up Ass'y
Top View
Drive Rack Unit
Line Up
Wiper Arm Unit

5.2.4. Full Erase Head and Cylinder Unit

Fig. J2


Flexible Cable
3 Cylinder Unit
Guide Pins
2 Full Erase Head
(L-1)
Audio Control Head Unit
(S-3)
Note:
Use extreme care when removing or replacing the Cylinder Unit. Do not touch the Video Heads during servicing.

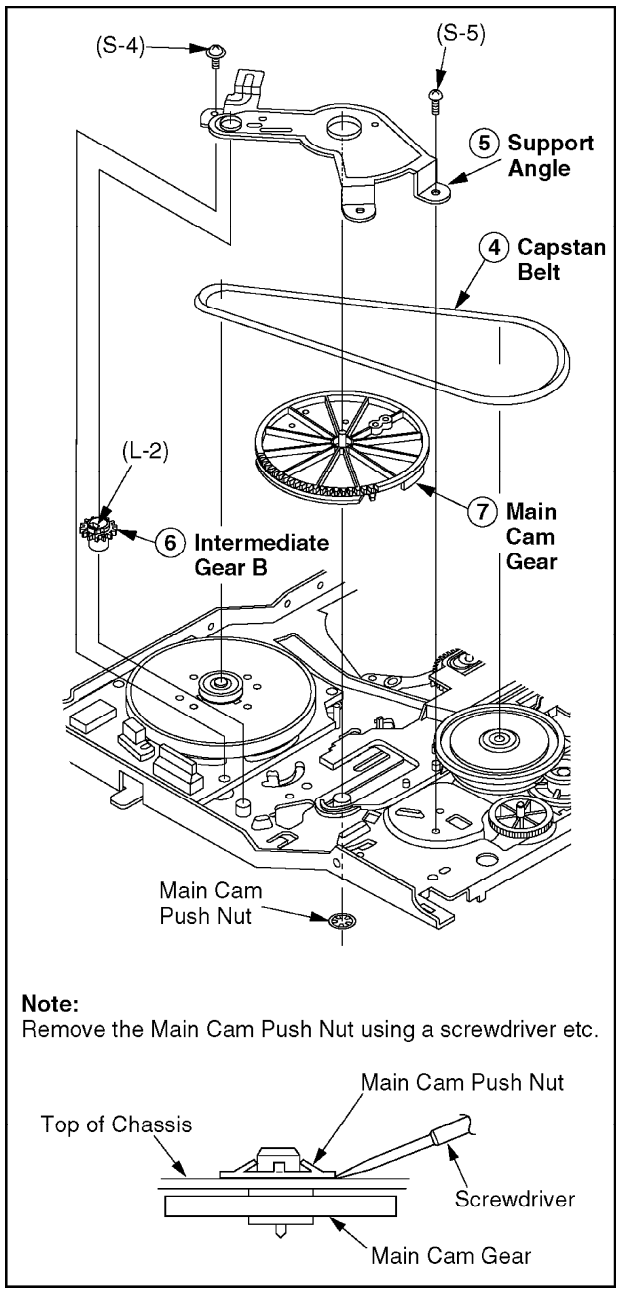
5.2.4.1. Reassembly Notes

1. After replacing the Cylinder Unit, clear the Total elapsed "Cylinder

rotation" time (in hours) to 0. Refer to "USAGE SCREEN MODE" in SERVICE NOTES.

5.2.5. Capstan Belt, Support Angle, Intermediate Gear B, and Main Cam Gear

Fig. J3-1



5.2.5.1. Reassembly Notes

1. Alignment of Main Cam Gear, Drive Rack Arm, and Main Rod

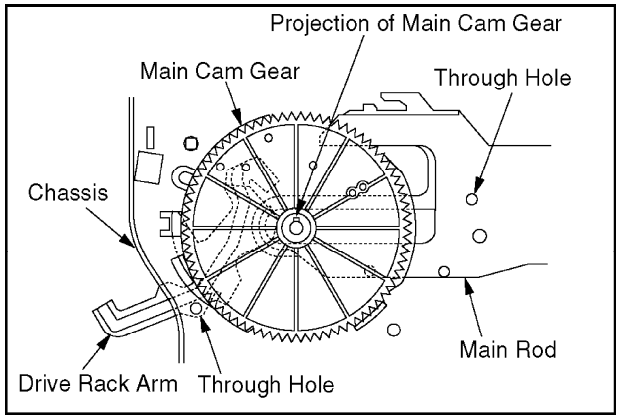
A. Confirm that the hole on Main Rod is a Through Hole with a hole on chassis.

B. Confirm that the hole on Drive Rack Arm is a Through Hole with a hole on chassis.

C. Install the Main Cam Gear so that the projection of Main Cam Gear

is in the upward position as shown.

Fig. J3-2

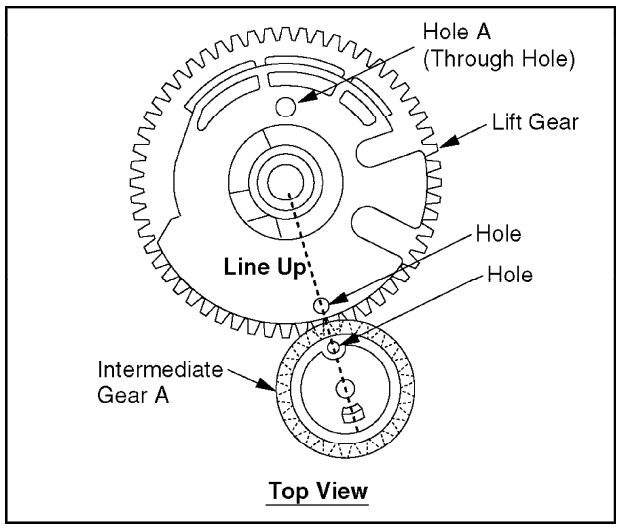


2. Confirmation/Alignment of Intermediate Gear B, Main Cam Gear, and Intermediate Gear A

A. Confirm that the Hole A on Lift Gear is a Through Hole with a hole on chassis.

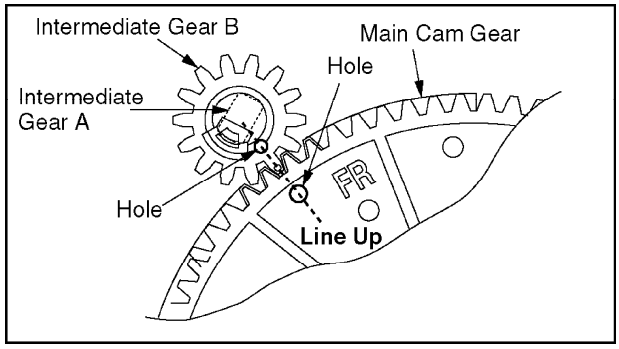
B. Confirm that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.

Fig. J3-3



C. Install the Intermediate Gear B so that the hole on the Intermediate Gear B is aligned with the hole on the Main Cam Gear.

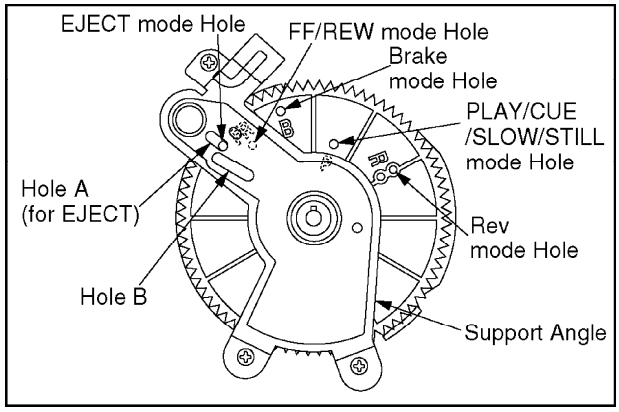
Fig. J3-4



3. Holes on Main Cam Gear

A. The EJECT mode Hole on Main Cam Gear should be a Through Hole with Hole A on Support Angle in EJECT mode. The each mode Hole on Main Cam Gear should be a Through Hole with Hole B on Support Angle in each mode.

Fig. J3-5



4. Main Cam Gear Kit

A. Main Cam Gear is supplied as a Main Cam Gear Kit only (Kit No. VVGS0009).

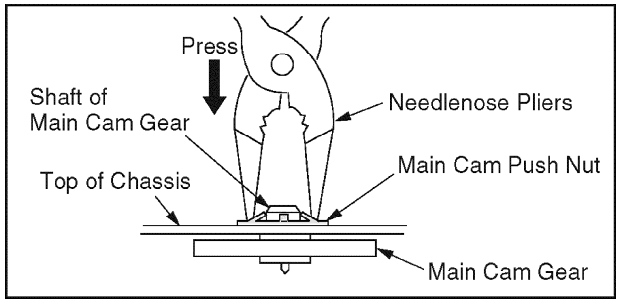
Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut.

However, Main Cam Push Nut is available separately as a replacement part.

5. Installation of Main Cam Gear and Main Cam Push Nut

A. After installing the Support Angle, install the Main Cam Push Nut with Needlenose Pliers etc. so that it is flush with the chassis. There may be some slight scratches on the Shaft of Main Cam Gear, when removing the Main Cam Gear. In case that the Main Cam Gear can be installed securely without tottering, it is fine to use the one. If any tottering, install all new parts.

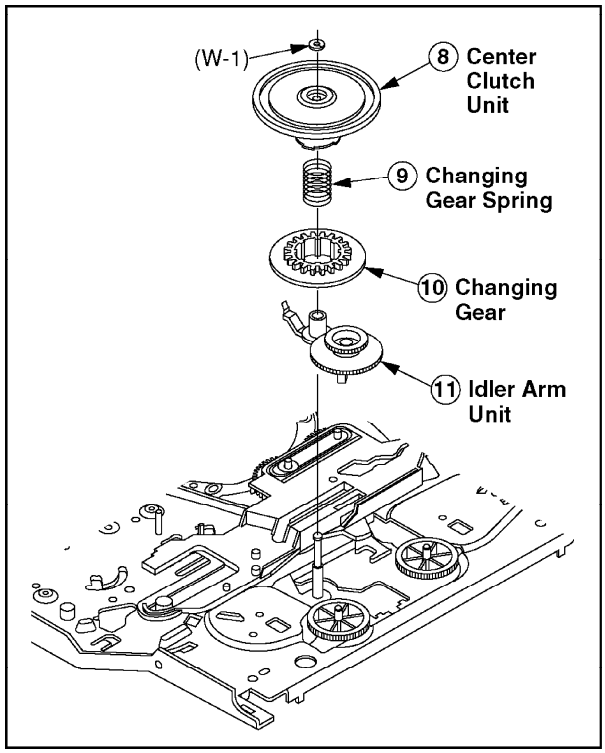
Fig. J3-6



6. The Main Cam Push Nut is not reusable. Install a new one.

5.2.6. Center Clutch Unit, Changing Gear Spring, Changing Gear, and Idler Arm Unit

Fig. J4-1

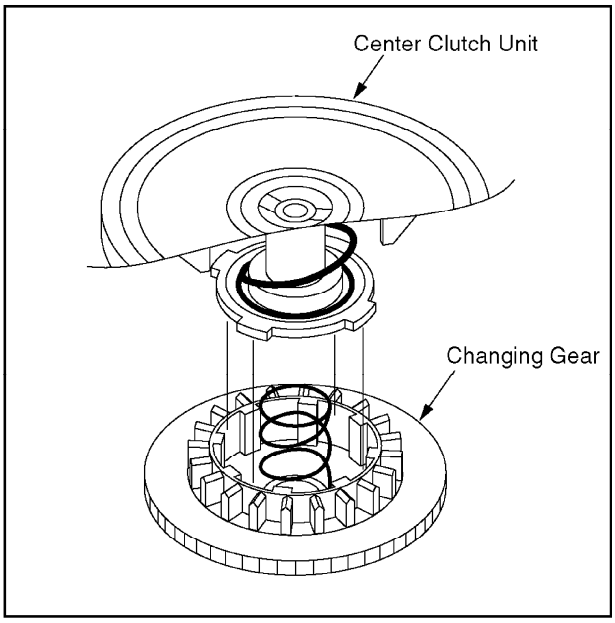


5.2.6.1. Reassembly Notes

1. Installation of Center Clutch Unit

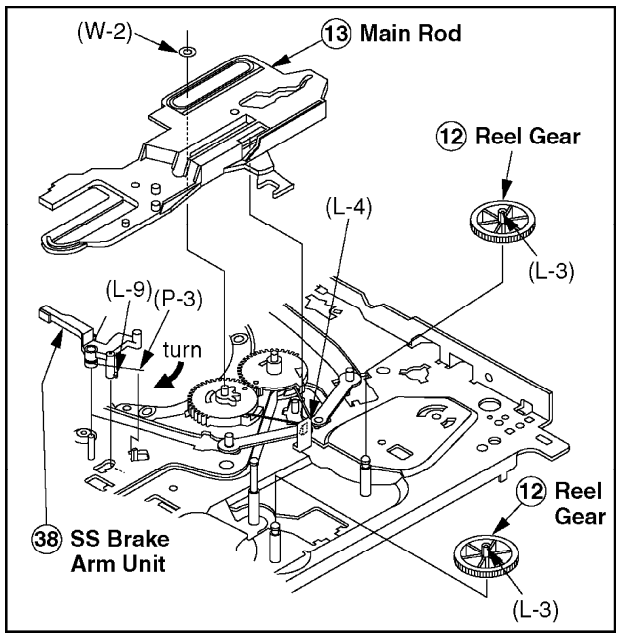
A. Fit the Center Clutch Unit into the Changing Gear.

Fig. J4-2



5.2.7. Reel Gear, Main Rod, and SS Brake Arm Unit

Fig. J5-1

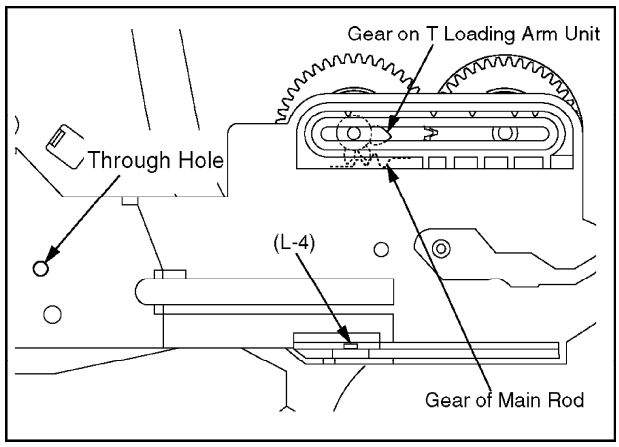


5.2.7.1. Reassembly Notes

1. Alignment of Main Rod and T Loading Arm Unit

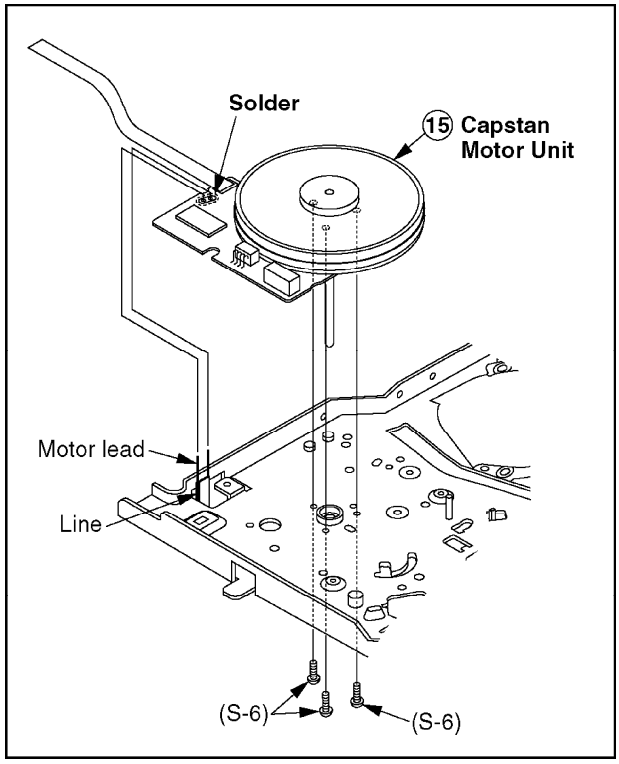
A. Align the Gear on T Loading Arm Unit with Gear of Main Rod. Confirm that the Hole on Main Rod is a Through Hole with a hole on chassis.

Fig. J5-2



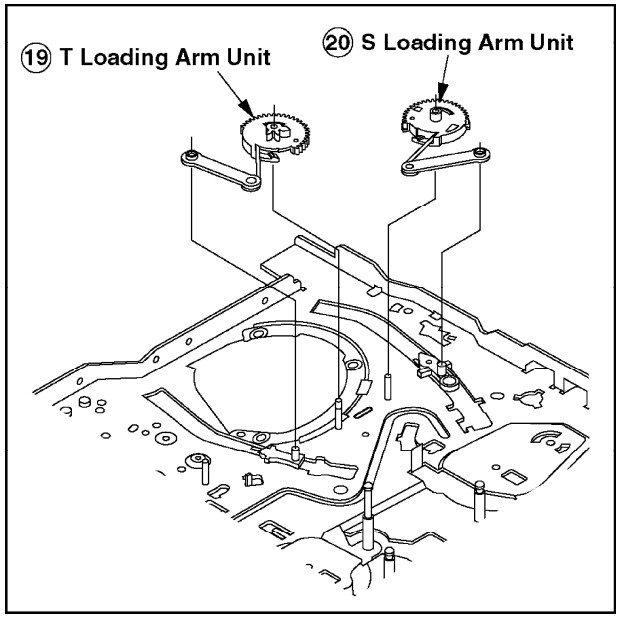
5.2.8. Capstan Motor Unit

Fig. J6



5.2.9. T Loading Arm Unit and S Loading Arm Unit

Fig. J7-1



5.2.9.1. Reassembly Notes

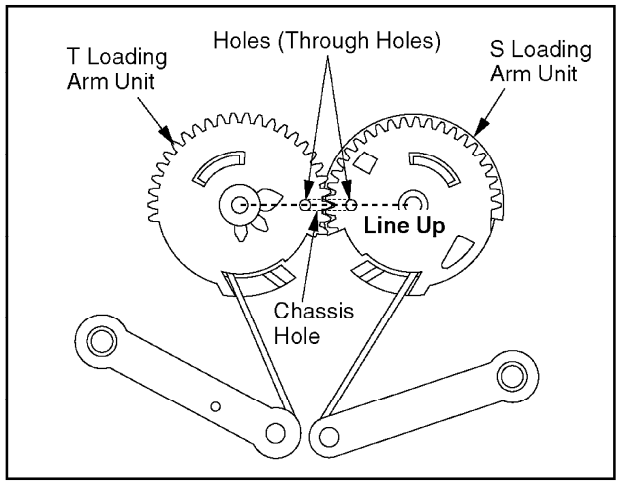
1. Alignment of T Loading Arm Unit and S Loading Arm Unit

A. Install the S Loading Arm Unit onto the chassis.

B. Install the T Loading Arm Unit so that the hole on T Loading Arm Unit is aligned with the hole on S Loading Arm Unit.

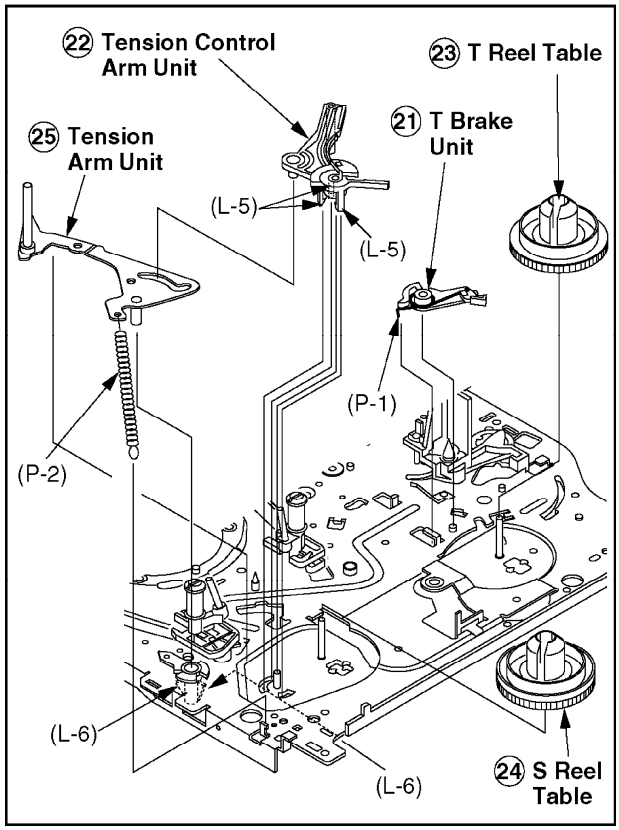
C. Confirm that the holes on the S & T Loading Arm Unit are Through Holes with hole on chassis.

Fig. J7-2



5.2.10. T Brake Unit, Tension Control Arm Unit, T Reel Table, S Reel Table, and Tension Arm Unit

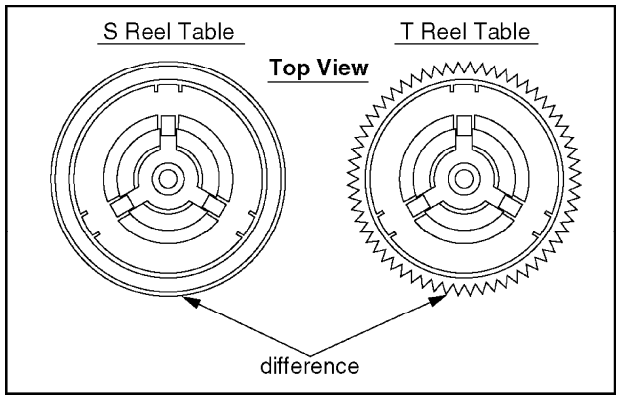
Fig. J8-1



5.2.10.1. Reassembly Notes

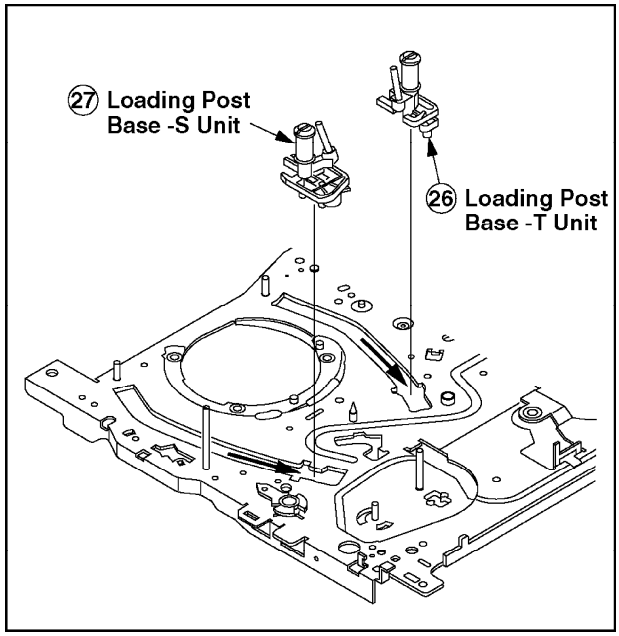
1. How to distinguish between S Reel Table and T Reel Table

Fig. J8-2



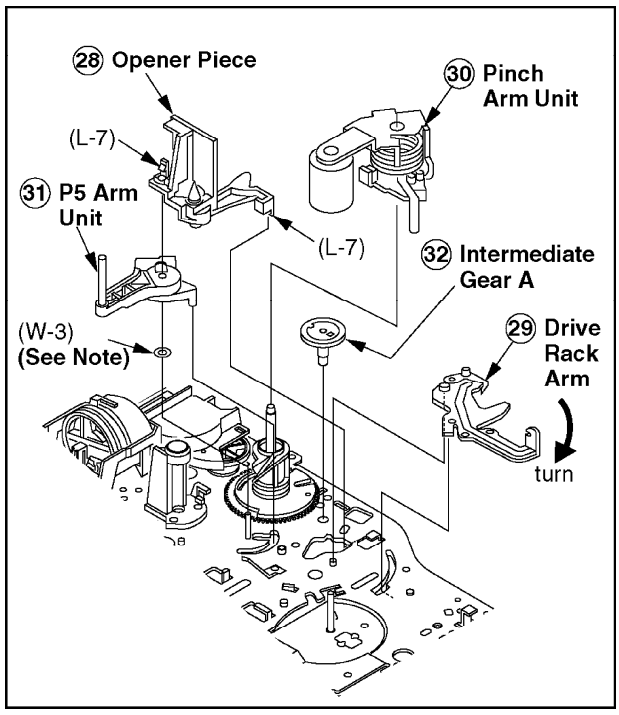
5.2.11. Loading Post Base -T Unit and Loading Post Base -S Unit

Fig. J9



5.2.12. Opener Piece, Drive Rack Arm, Pinch Arm Unit, P5 Arm Unit, and Intermediate Gear A

Fig. J10-1



Note:

In early units, a washer is used. When servicing the washer or the P5 Arm Unit, replace only the P5 Arm Unit with a new one, and remove the washer.

5.2.12.1. Reassembly Notes

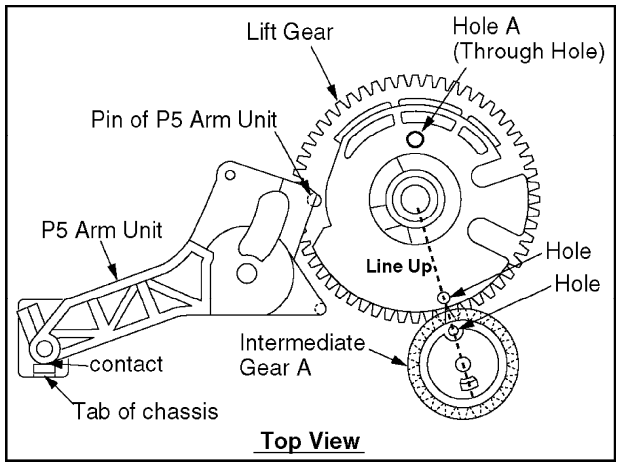
1. Installation/Alignment of Intermediate Gear A, Lift Gear and P5 Arm Unit

A. Rotate the Lift Gear so that Hole A on Lift Gear is a Through Hole with a hole on chassis.

B. Install the Intermediate Gear A so that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.

C. Install the P5 Arm Unit so that it contacts with the tab of chassis.

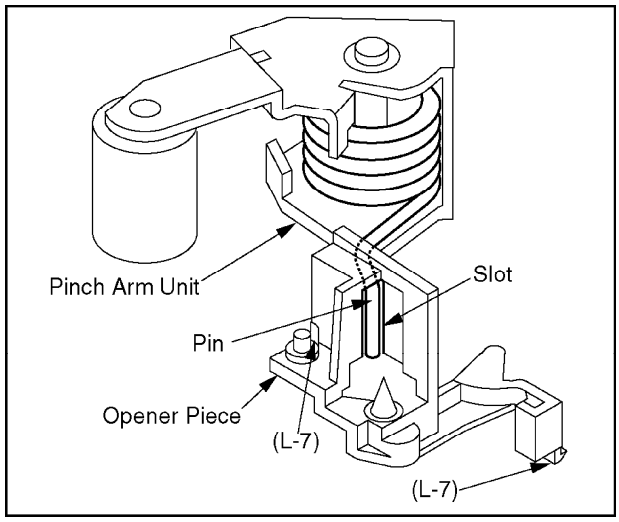
Fig. J10-2



2. Installation of Opener Piece

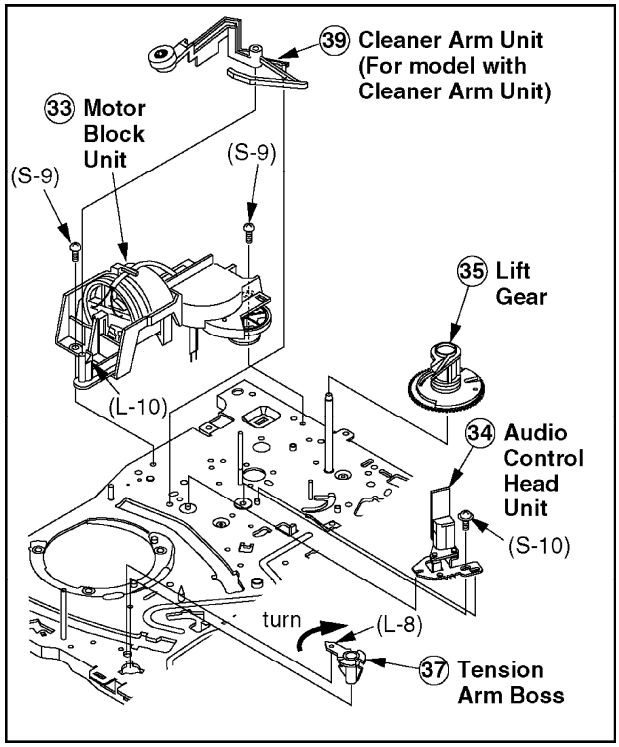
A. Install the Opener Piece so that the slot of the Opener Piece is inserted to the Pin of Pinch Arm Unit

Fig. J10-3



5.2.13. Motor Block Unit, Audio Control Head Unit, Lift Gear, Tension Arm Boss, and Cleaner Arm Unit

Fig. J11



5.3. CASSETTE UP ASSEMBLY SECTION

This chart indicates Step/Location No. of Parts to be serviced and prior steps to gain access items to be serviced when disassembling. When reassembling, perform the step(s) in the reverse order.

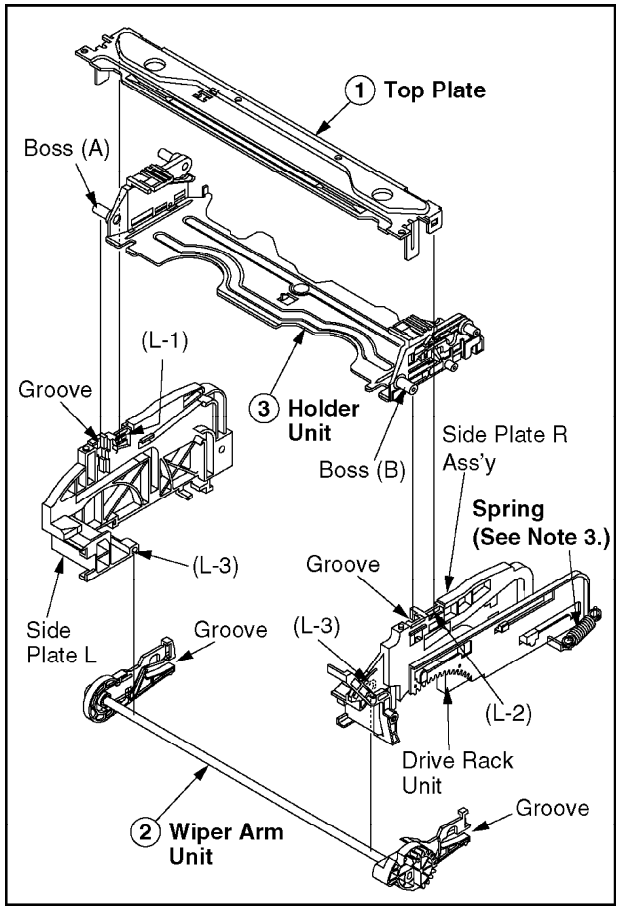
Step/Loc. No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	----------	Top Plate	K1-1	(L-1), (L-2)	
②	1	Wiper Arm Unit	K1-1	2(L-3)	Gear Alignment
③	1,2	Holder Unit	K1-1	-	
④	----------	Opener Lever	K2	2(L-4)	
⑤	1,2,3,4	Drive Rack Unit	K2	-	
↑ A	↑ B	↑ C	↑ D	↑ E	↑ F

How to read chart shown above:

A: Order of Procedure steps.
When reassembling, perform steps(s) in reverse order.
These numbers are also used as the identification (location) No. of parts in Figures.
B: Steps to be completed prior to the current step.
C: Part to be removed or installed.
D: Fig. No. showing Procedure or Part Location.
E: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.
(S-1) = Screw (S-1), (L-1) = Locking Tab (L-1), (W-1) = Washer (W-1), (P-1) = Spring (P-1), (C-1) = Cut Washer (C-1)
F: Alignment/Adjustment which is required when installing or replacing each Parts.

5.3.1. Top Plate, Wiper Arm Unit, and Holder Unit

Fig. K1-1



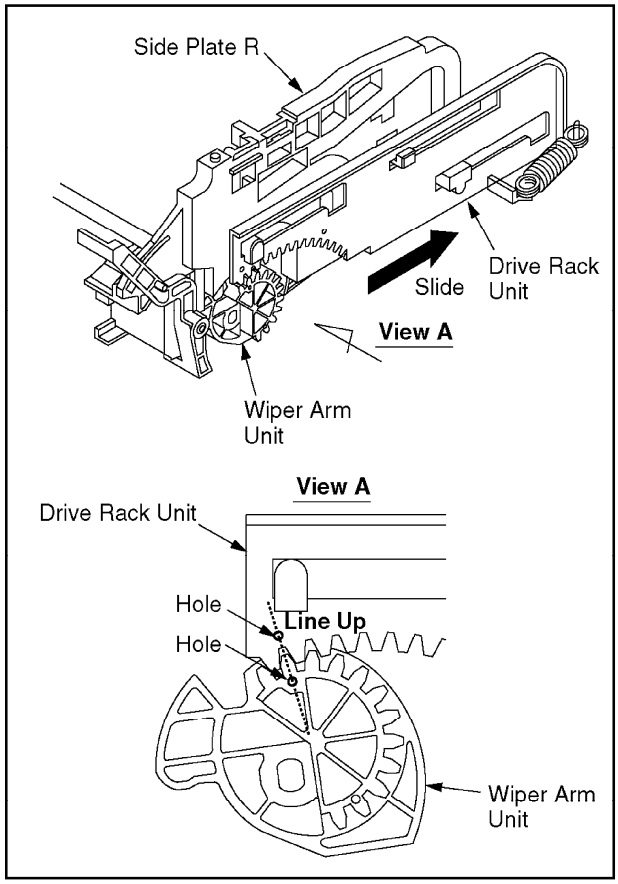
5.3.1.1. Reassembly Notes

1. Alignment of Wiper Arm Unit and Drive Rack Unit

A. Slide the Drive Rack Unit to the far right as indicated by the arrow.

B. Install the Wiper Arm Unit so that the hole on the Wiper Arm Unit is aligned with the hole on the Drive Rack Unit.

Fig. K1-2



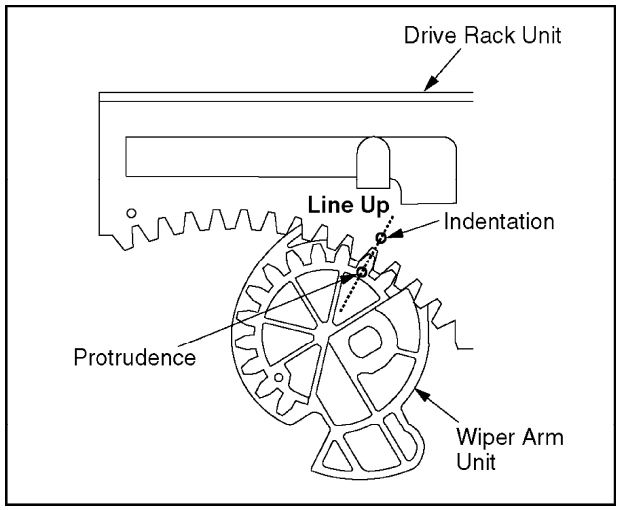
2. Installation of Holder Unit

A. Turn the Wiper Arm Unit so that the grooves on each end are aligned with the each groove on Side Plate L and R.

B. Insert Holder Unit boss (A) and (B) into the grooves as shown in Fig. K1-1.

C. Finally, in the EJECT Position, confirm that the protrudence on the Wiper Arm Unit is aligned with the indentation on the Drive Rack Unit.

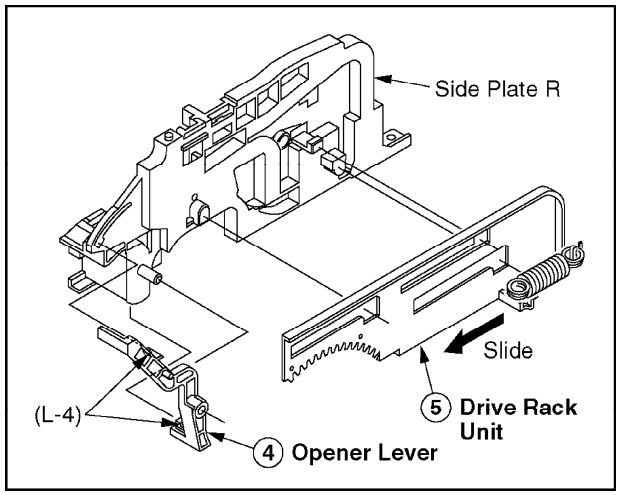
Fig. K1-3



3. Make sure to hook the spring to the Drive Rack Arm of Mechanism chassis.

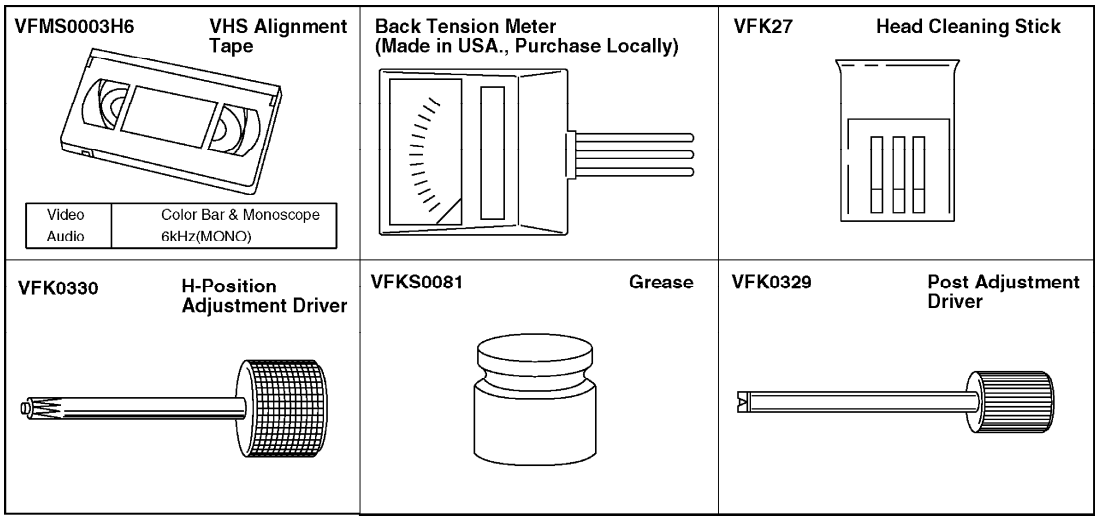
5.3.2. Opener Lever and Drive Rack Unit

Fig. K2



6. ADJUSTMENT PROCEDURES

6.1. SERVICE FIXTURES AND TOOLS

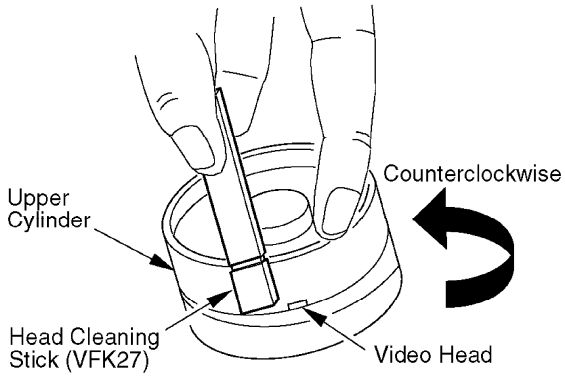


6.2. MECHANICAL ADJUSTMENT

6.2.1. CLEANING PROCEDURE FOR THE UPPER CYLINDER UNIT

1. While slowly turning the Upper Cylinder Unit counterclockwise by hand, gently rub the Video Heads with a Head Cleaning Stick (VFK27) moistened with Ethanol.
When using a Cleaning Cassette, make sure to use "DRY" type only and be aware that excessive use can shorten head life.

Fig. M1



Note:

1. **Do not rub vertically or apply excess pressure to the Video Heads. Do not turn the Upper Cylinder Unit clockwise while cleaning.**
2. **After cleaning, use a Dry Head Cleaning Stick (VFK27) to remove any Ethanol remaining on the cylinder tape path. Otherwise, tape damage will occur.**

6.2.2. ADJUSTMENT PROCEDURES

6.2.2.1. BACK TENSION CONFIRMATION

Purpose:

To fine adjust the Back Tension so that the tape runs smoothly with a constant tension.

Symptom of Misadjustment:

1) If the tape tension is less than the specified value, the tape cannot come into proper contact with the Video Heads, resulting in poor picture playback.

2) If the tape tension is too high, the tape will soon be damaged.

Equipment Required:

Back Tension Meter (Made in U.S.A., Purchase Locally)

VHS Cassette Tape (120-Minute Tape)

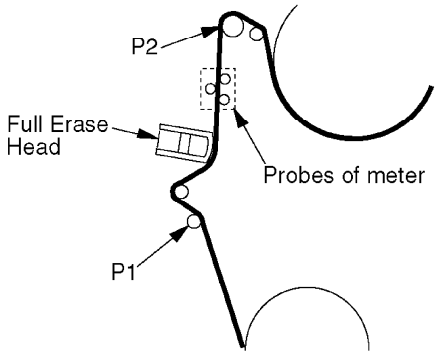
Specification:

22.4 gf±2.5 gf

(0.220 N±0.025 N)

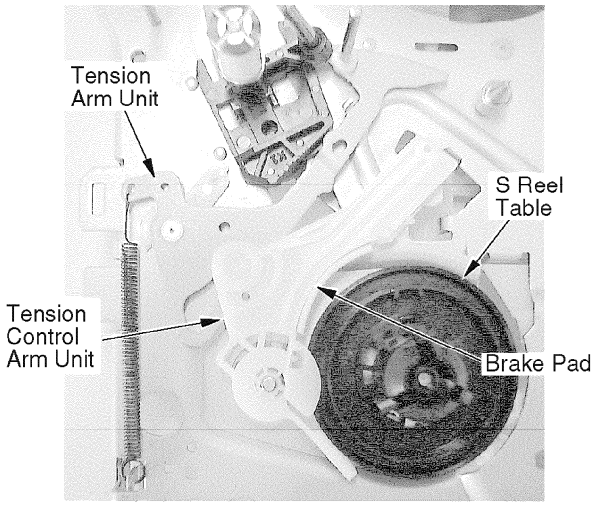
1. **Play back a T120 cassette tape from the beginning for approx. 10 to 20 seconds to stabilize tape movement.**
2. **Insert a Tension Meter into tape path and measure the back tension.**

Fig. M2-1



3. If the reading is out of specification, make sure that there is no dust or foreign material between the Brake Pad of Tension Control Arm Unit and the S Reel Table.
After cleaning, the reading of tension measurement is still out of specification, replace the Tension Arm Unit and the Tension Control Arm Unit.

Fig. M2-2



Note:

1. Be sure that the three probes of the meter are all in solid contact with the tape, but not touching any other parts of the mechanism.

2. It is recommended that measurements should be repeated at least three (3) times because the tension meter is very sensitive to external vibrations.

6.2.2.2. TAPE INTERCHANGEABILITY ADJUSTMENT

Note:

To perform these adjustment/confirmation procedures, enter the Tracking center mode.

Equipment Required:

Dual Trace Oscilloscope
VHS Alignment Tape (VFMS0003H6)
Post Adjustment Driver (VFK0329)
H-Position Adjustment Driver (VFK0330)

6.2.2.2.1. ENVELOPE OUTPUT ADJUSTMENT

The height of the P2 and P3 Posts replacement part is preadjust at the factory.

Purpose:

To achieve a satisfactory picture and secure precise tracking.

Symptom of Misadjustment:

If the envelope is output poorly, much noise will appear in the picture. Then the tracking will lose precision and the playback picture will be distorted by any slight variation of the tracking control circuit.

Equipment Required:

Post Adjustment Driver (VFK0329)

1. **Insert the alignment tape.**
2. **Press and hold FF button and CH DOWN buttons on VCR together over 5 seconds in power off condition.**
   The power comes on and the unit goes into service mode.
3. **Play back the alignment tape.**
4. **To enter Tracking center mode, press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.**
5. **Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.**
6. **Confirm that the RF envelope is flat enough (V1/V-max. is 0.7 or more). If not, with Post Adjustment Driver, adjust P2 and P3 post height so that the envelope waveform becomes as flat (V1/V-max. is 0.7 or more) as possible (No envelope drop). If the envelope drop appears on the left-half of the waveform, adjust P2 post height. If the envelope drop appears on the right-half of the waveform, adjust P3 post height.**

CAUTION:

Overtightening P2 and P3 posts may cause the threads to strip.

Note:

It will be possible to confirm Step 6 according to following steps.

1. **Release the Tracking center mode.**
2. **Press the Tracking Control Up or Down button on remote control. Make sure that the envelope waveform remains flat. If not, readjust P2**

and/or P3 post heights.

Fig. M3-1

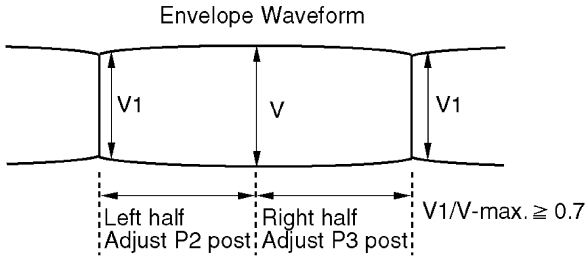
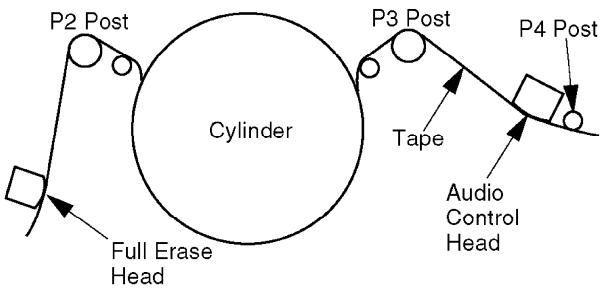
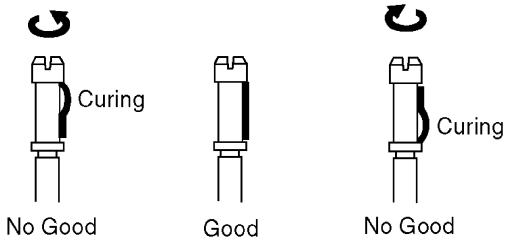


Fig. M3-2



7. After adjustment, confirm that the tape travels without curling at P2 and P3 posts.

Fig. M3-3



8. To release from Tracking center mode, press PLAY or STOP button.

6.2.2.2.2. AUDIO CONTROL HEAD TILT ADJUSTMENT

Purpose:

To confirm that the tape runs smoothly. In particular, confirm that the tape properly picks up the Audio Signal at the upper part of the head and the Control Signal at the lower part of the head.

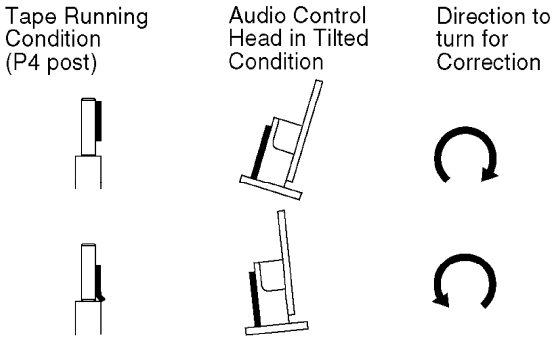
Symptom of Misadjustment:

If the tilt of the Audio Control Head is poorly adjusted, the tape will eventually be damaged. An intermittent Blue screen may be seen in Playback.

1. Play back a T120 cassette tape and check that the tape travels smoothly between the upper and lower guides of the P4 post.

2. If necessary, adjust Black Screw (B) clockwise until the tape begins to curl at the lower edge of the P4 post. Then adjust the screw counterclockwise until the curling is eliminated.

Fig. M4



6.2.2.2.3. AUDIO CONTROL HEAD HEIGHT ADJUSTMENT

The height of the Audio Control Head replacement part is preset at the factory.

Purpose:

To be sure the tape runs properly along the Control Head.

Symptom of Misadjustment:

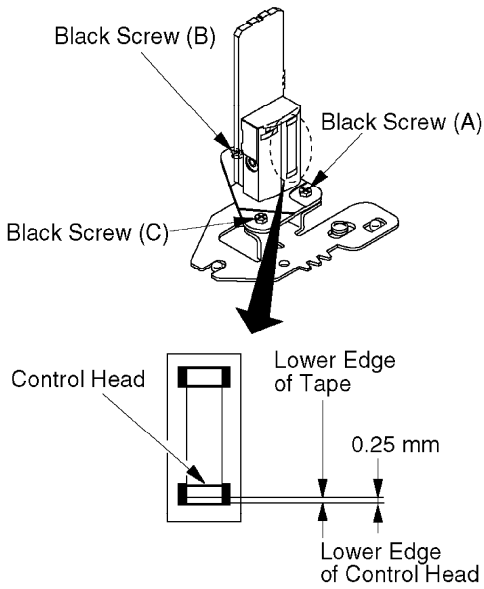
If the control signal is not properly picked up, Servo Operation cannot be achieved. A Blue screen will be seen in Playback.

This confirmation is required when the Audio Control Head is replaced.

1. Play back a T120 cassette tape and check that the lower edge of the tape runs approximately 0.25 mm above the lower edge of the Audio Control Head.

2. If necessary, adjust Black Screws (A) and (B) clockwise to lower the tape or counterclockwise to raise.

Fig. M5



6.2.2.2.4. AUDIO CONTROL HEAD AZIMUTH ADJUSTMENT

Purpose:

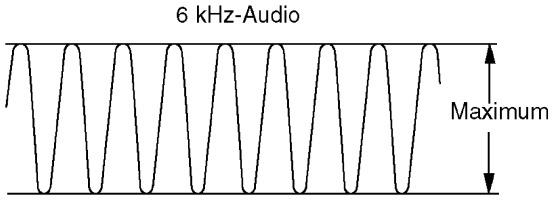
To adjust the position and height of the Audio Control Head so that it meets the tape tracks properly.

Symptom of Misadjustment:

If the position of the Audio Control Head is not properly adjusted, the Audio S/N Ratio is poor.

1. **Connect the oscilloscope to the audio output jack on the rear side of the deck.**
2. **Play back the 6 kHz Monaural Audio portion of the alignment tape.**
3. **Adjust Black Screw (C) on the Audio Control Head base so that the output level is at maximum.**

Fig. M6



4. **Confirm the height of the Audio Control Head is proper. If not, readjust Black Screws (A) and (B).**

6.2.2.2.5. AUDIO CONTROL HEAD HORIZONTAL POSITION ADJUSTMENT

Purpose:

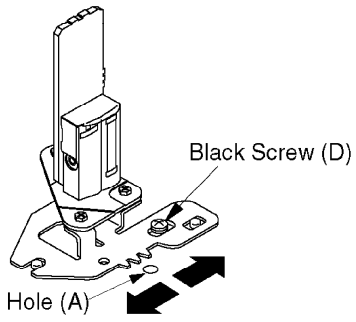
To adjust the Horizontal Position of the Audio Control Head.

Symptom of Misadjustment:

If the Horizontal Position of the Audio Control Head is not properly adjusted, a maximum envelope cannot be obtained at the Neutral Position of the Tracking Control Circuit.

1. **Insert the alignment tape.**
2. **Press and hold FF button and CH DOWN buttons on VCR together over 5 seconds in power off condition.**
   The power comes on and the unit goes into service mode.
3. **Play back the alignment tape.**
4. **To enter Tracking center mode, press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.**
5. **Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.**
6. **Loosen the Black Screw (D) and tighten it slightly. Set the H-Position Adjustment Driver into the Hole (A). Then slowly turn the fixture either clockwise or counterclockwise so that the envelope is at maximum.**

Fig. M7



7. **Tighten Black Screw (D).**
8. **To release from Tracking center mode, press PLAY or STOP button.**

Note:

Old type of H-Position Adjustment Driver (VFK0136) can be used for this adjustment.

6.3. ELECTRICAL ADJUSTMENT

6.3.1. EVR (Electronic Variable Resister) ADJUSTMENT WITH THE REMOTE CONTROL

This unit has electronic technology using I2C Bus concept.The PG SHIFTER ADJUSTMENT is adjusted by using " On Screen Display " and the remote control instead of adjusting mechanical controls (VR).

6.3.2. TEST EQUIPMENT

To do all of these electrical adjustments, the following equipment is required.

1. Dual-Trace Oscilloscope
Voltage Range: 0.001 V to 50 V/Div.
Frequency Range: DC to 50 MHz
Probes: 10:1, 1:1

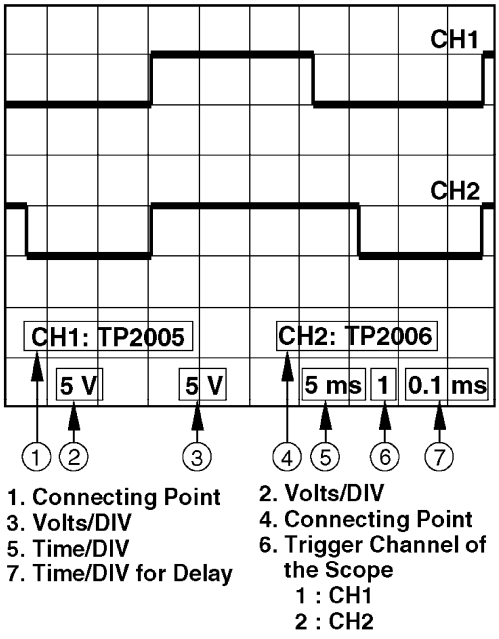
2. Isolation Transformer (Variable)

3. VHS Alignment Tape (VFMS0003H6)

4. TV monitor

6.3.3. HOW TO READ THE ADJUSTMENT PROCEDURES

Fig.E1



6.3.4. PG SHIFTER ADJUSTMENT

Purpose:
Determine the Video Head Switching Point during Playback.

Symptom of Misadjustment:
May cause Head Switching Noise and/or Vertical Jitter.

Test Point :
TP3001 (Main C.B.A.),
TP6205 (Main C.B.A.)

Specification:
T = 6 H±0.5 H (0.38 ms±0.03 ms)

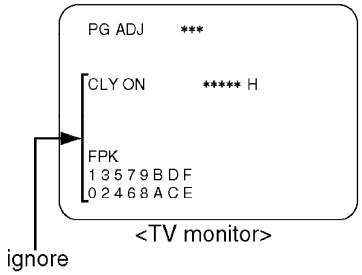
Mode :
SP Playback

Equipment :

Oscilloscope,
VHS Alignment Tape (VFMS0003H6),
TV monitor

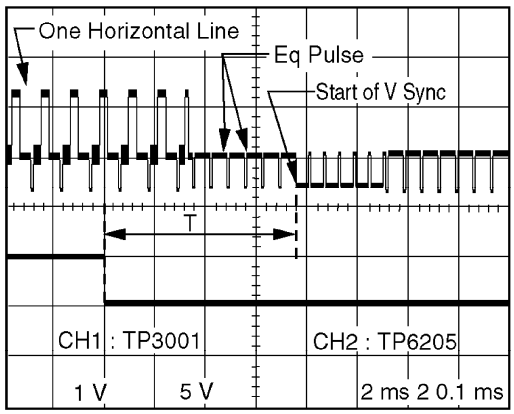
1. **Insert the VHS Alignment Tape. Then turn off the power. Enter service mode by pressing and holding FF and CH DOWN buttons on VCR together for more than 5 seconds in power off condition. The power comes on.**
2. **Playback in SP mode. Then, press 100 button on the remote to enter EVR PG SHIFTER ADJUSTMENT mode. PG ADJUSTMENT screen will appear on the TV Monitor.**

Fig. E2-1



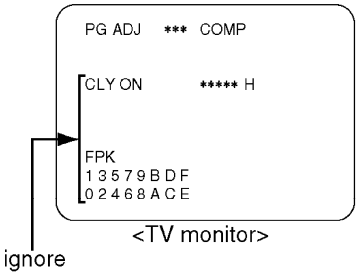
3. **Connect the channel-1 scope probe to TP3001 and the channel-2 scope probe to TP6205. Used TP6205 as a trigger**
4. **Adjust value so that the trailing edge of the head switching pulse is placed 6 H±0.5 H (0.38 ms±0.03 ms) before the start of the vertical sync pulse by pressing CH UP and CH DOWN buttons on the remote control.**

Fig. E2-2



5. **After adjustment is completed, press REC button on the remote control. Then " COMP " will appear on the TV monitor and adjusted value will be written to Memory IC (IC6005).**

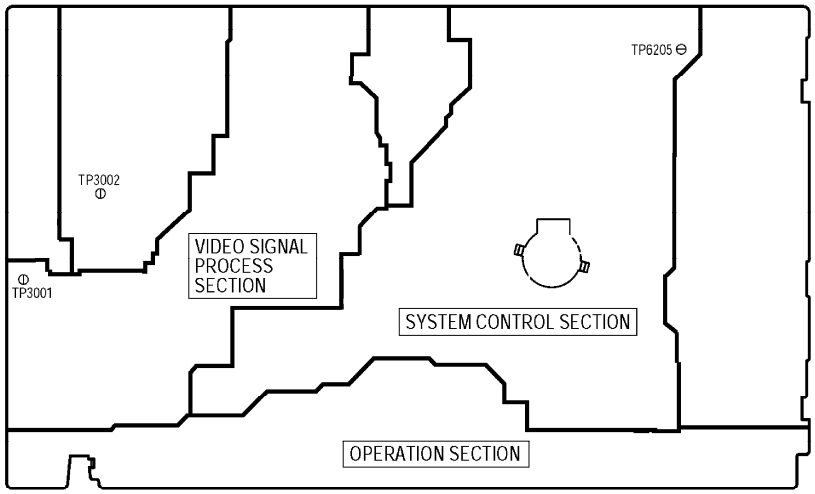
Fig.E2-3



6. Press STOP button on the remote control to release from EVR PG SHIFTER ADJUSTMENT MODE.

6.4. TEST POINTS AND CONTROL LOCATION

Main C.B.A.



(Component Side)

FUNCTION OF IMPORTANT TEST POINTS	
TP3001	Video Signal to Jack
TP3002	REC/PB Video envelope signal
TP6205	Head SW.

Test Point Information

Ⓘ Test Point with a jumper wire across a hole in the P.C.B.

7. SCHEMATIC DIAGRAMS

7.1. SCHEMATIC DIAGRAM & CIRCUIT BOARD LAYOUT NOTES

7.2. MAIN SCHEMATIC DIAGRAMS

7.3. INTERCONNECTION SCHEMATIC DIAGRAM

7.4. SIGNAL WAVEFORMS

8. CIRCUIT BOARD LAYOUT

8.1. MAIN C.B.A.

9. BLOCK DIAGRAMS

9.1. OVERALL BLOCK DIAGRAM (Model: PV-V402, PV-V4022)

9.2. OVERALL BLOCK DIAGRAM (Model: PV-V4522, PV-V4612)

10. EXPLODED VIEWS

10.1. MECHANISM (TOP) SECTION

❶ MECHANISM (TOP) SECTION

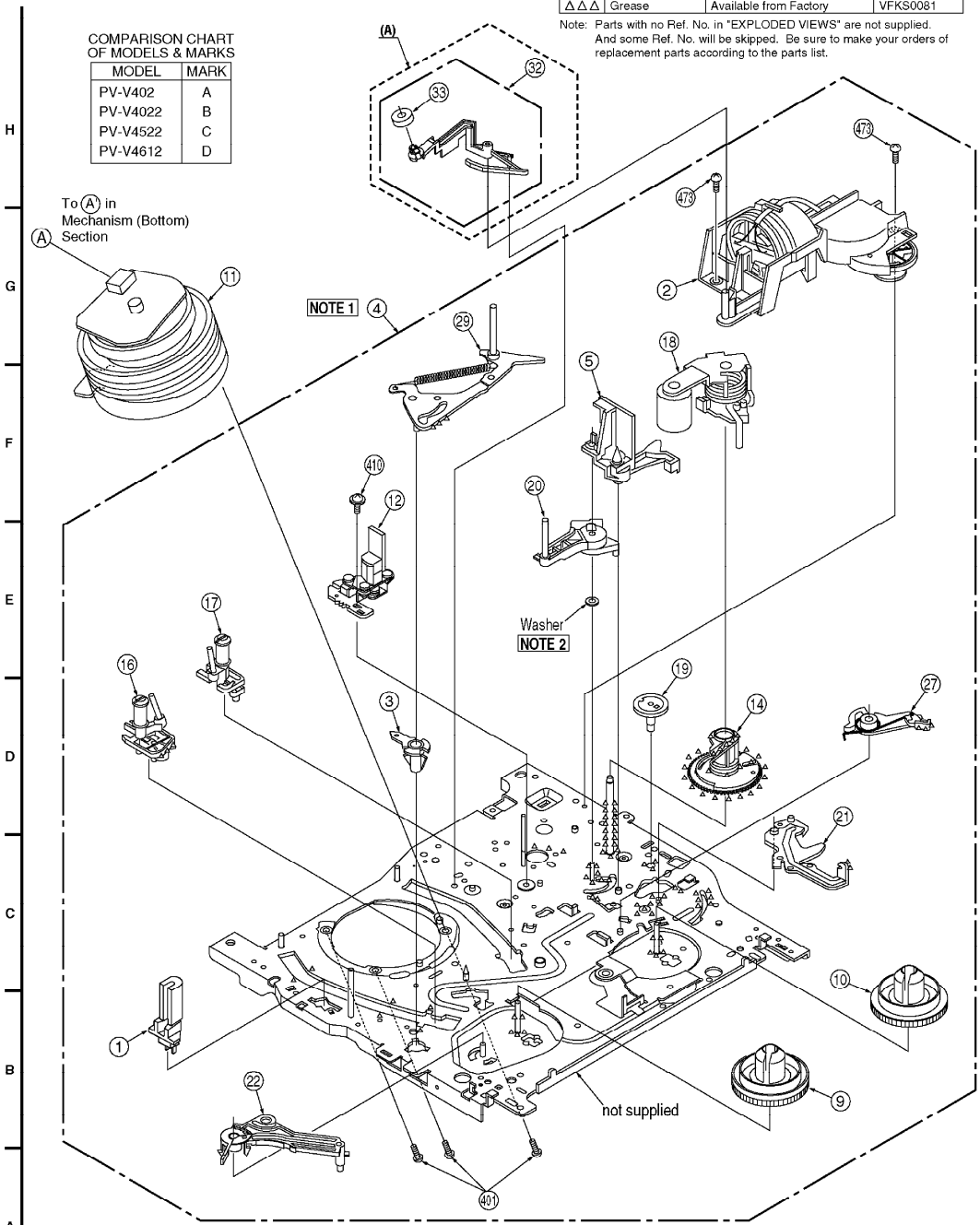
LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
△△△	Grease	Available from Factory	VFKS0081

Note: Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied. And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D



NOTE 1: The Mechanical Chassis Sub Ass'y (Ref. No. 4) consists of all the mechanical parts except the Cylinder Unit (Ref. No. 11) and the Cassette Up Ass'y (Ref. No. 61). After replacing the Mechanical Chassis Sub Ass'y, be sure to perform "TAPE INTERCHANGEABILITY ADJUSTMENT" in MECHANICAL ADJUSTMENT procedures.

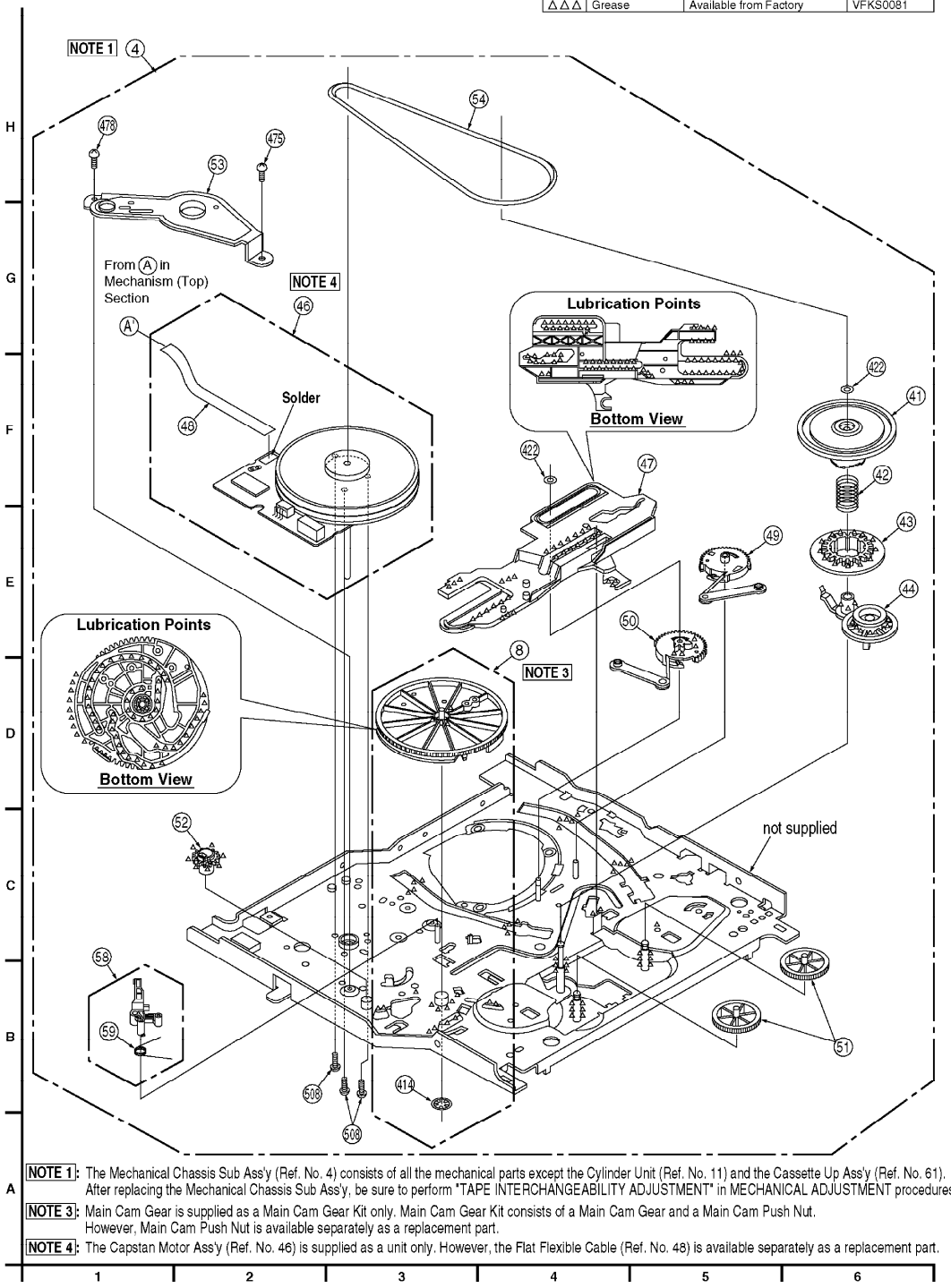
NOTE 2: In early units, a washer is used.
When servicing the washer or the P5 Arm Unit, replace only the P5 Arm Unit with a new one, and remove the washer.

10.2. MECHANISM (BOTTOM) SECTION

❷ MECHANISM (BOTTOM) SECTION

LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
△△△	Grease	Available from Factory	VFKS0081



NOTE 1: The Mechanical Chassis Sub Ass'y (Ref. No. 4) consists of all the mechanical parts except the Cylinder Unit (Ref. No. 11) and the Cassette Up Ass'y (Ref. No. 61). After replacing the Mechanical Chassis Sub Ass'y, be sure to perform "TAPE INTERCHANGEABILITY ADJUSTMENT" in MECHANICAL ADJUSTMENT procedures.

NOTE 3: Main Cam Gear is supplied as a Main Cam Gear Kit only. Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut. However, Main Cam Push Nut is available separately as a replacement part.

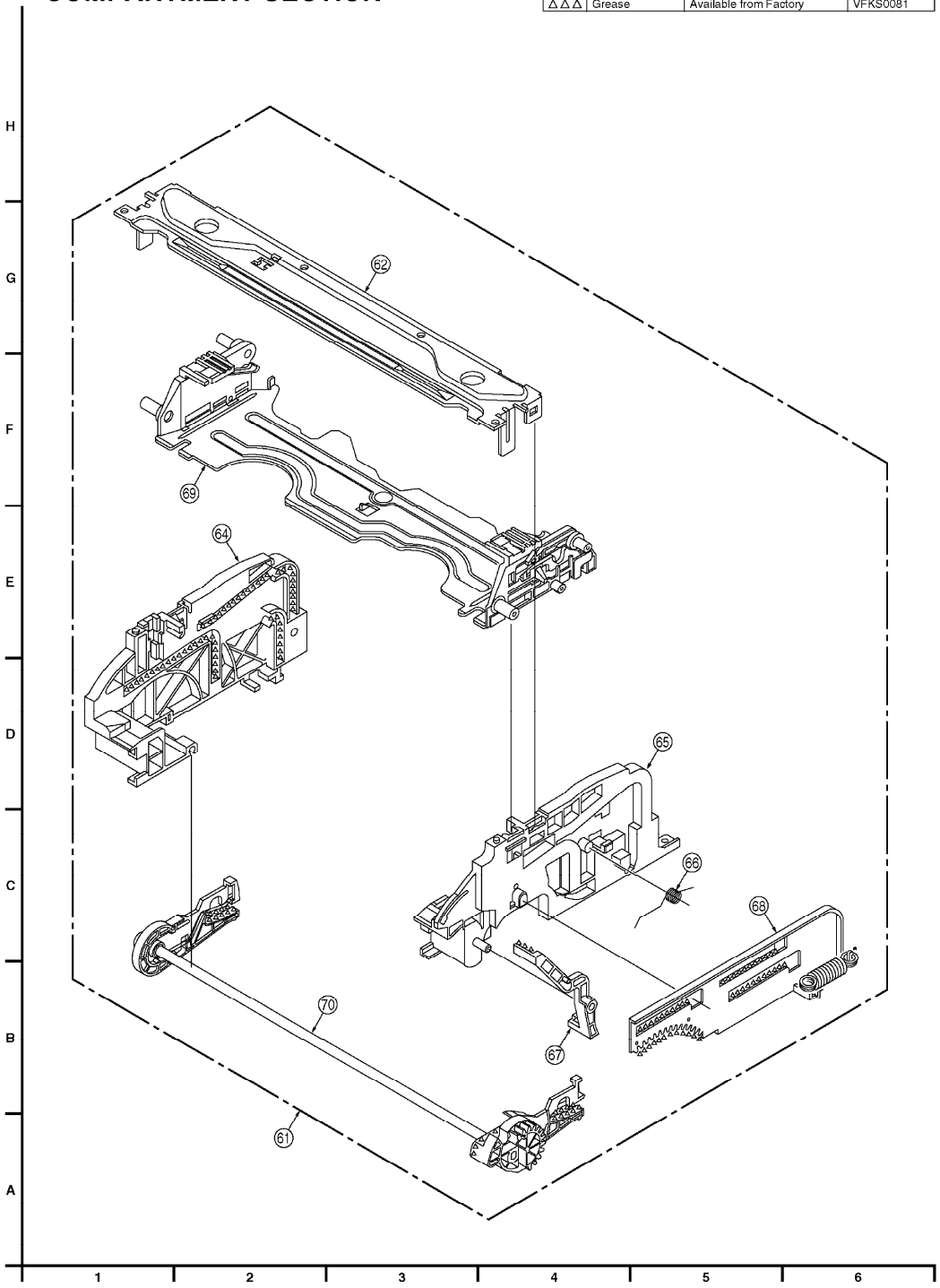
NOTE 4: The Capstan Motor Ass'y (Ref. No. 46) is supplied as a unit only. However, the Flat Flexible Cable (Ref. No. 48) is available separately as a replacement part.

10.3. CASSETTE UP COMPARTMENT SECTION

❸ CASSETTE UP COMPARTMENT SECTION

LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
△△△	Grease	Available from Factory	VFKS0081



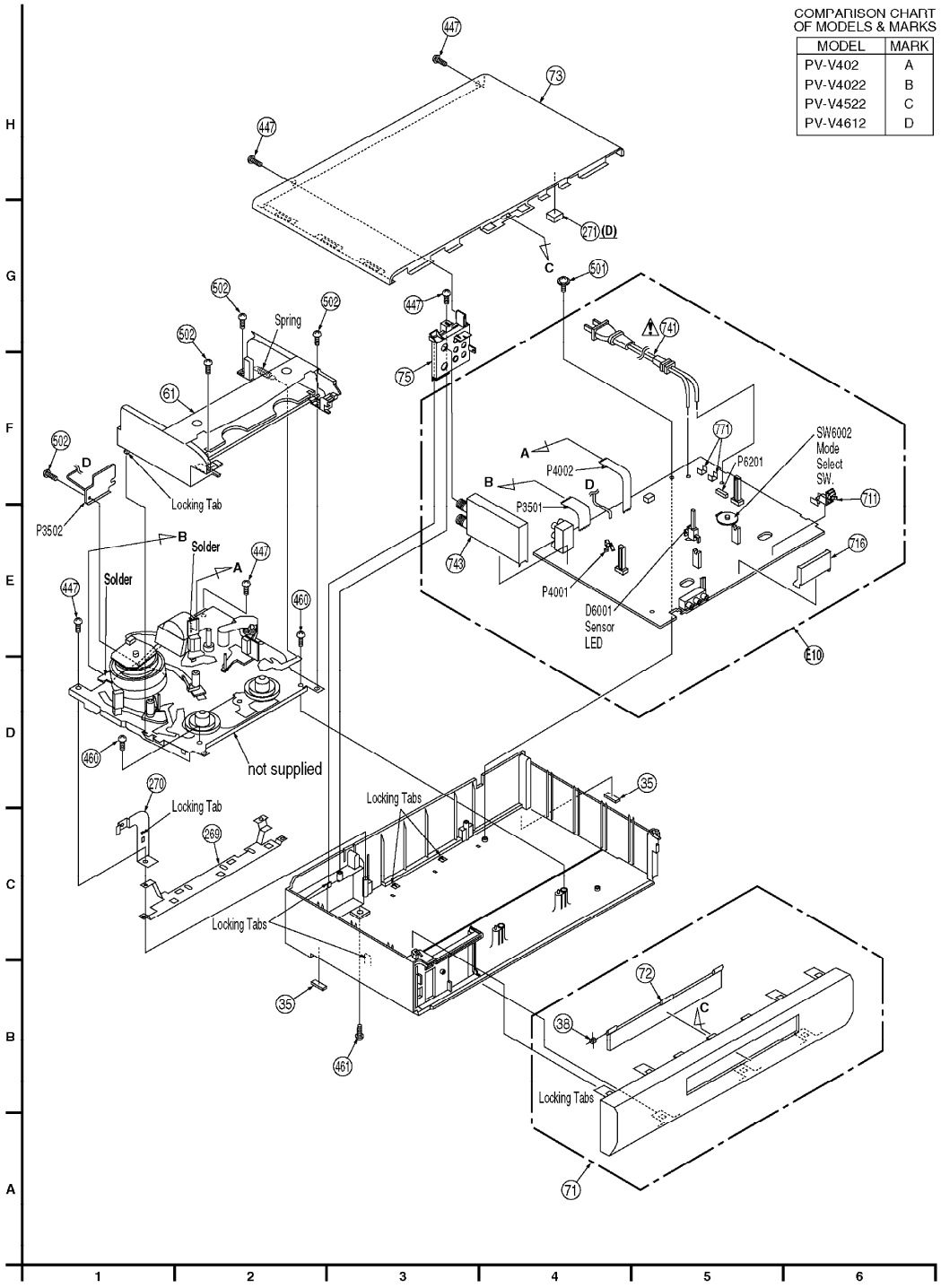
10.4. CHASSIS FRAME AND CASING PARTS SECTION

❹ CHASSIS FRAME AND CASING PARTS SECTION

IMPORTANT SAFETY NOTICE
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

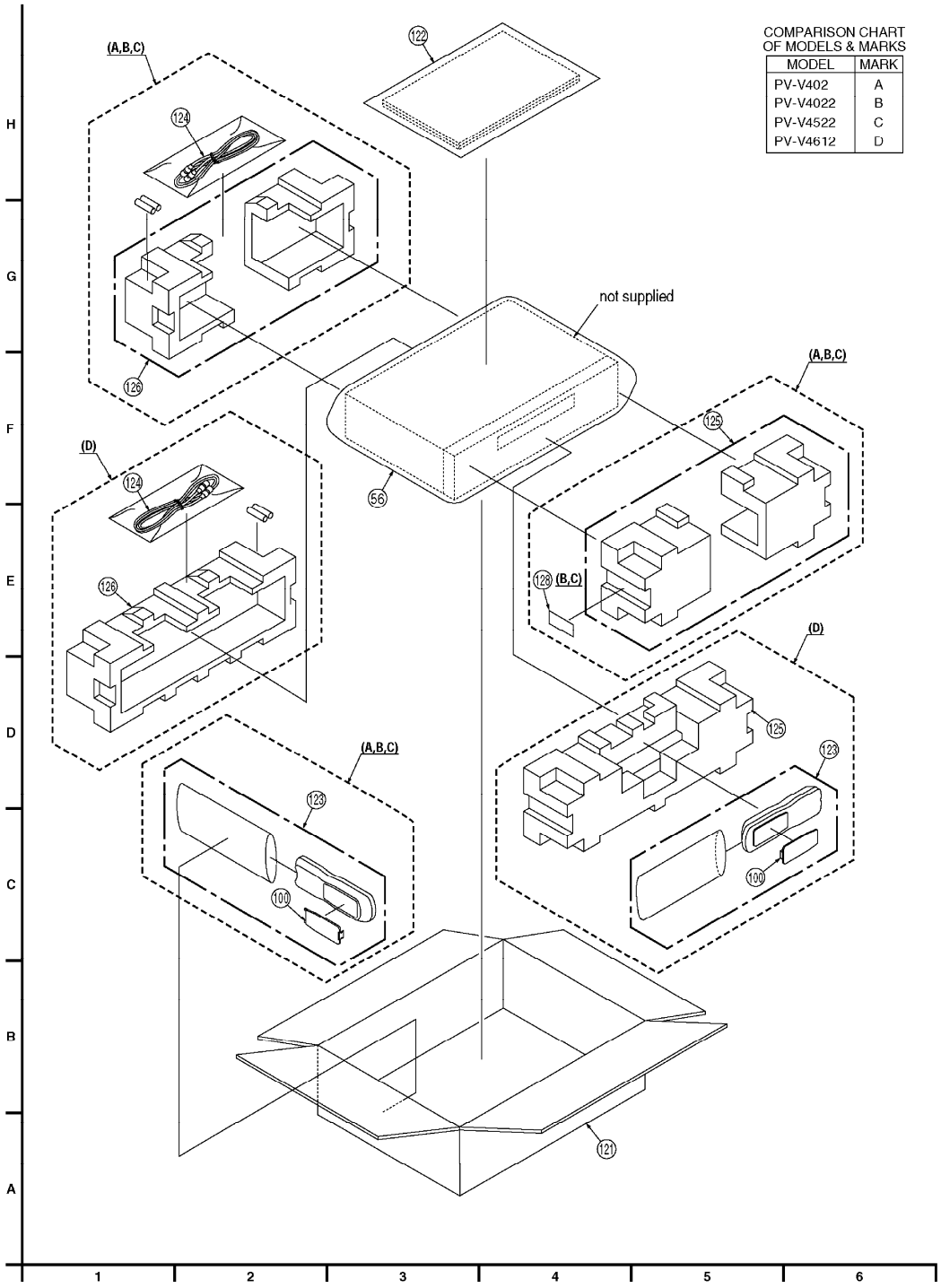
COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D



10.5. PACKING PARTS AND ACCESSORIES SECTION

❺ PACKING PARTS AND ACCESSORIES SECTION



11. REPLACEMENT PARTS LISTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

11.1. REPLACEMENT NOTES

11.1.1. General Notes

1. Use only original replacement parts:

To maintain original function and reliability of repaired units, use only

original replacement parts which are listed with their part numbers in the parts list.

2. **IMPORTANT SAFETY NOTICE**
   Components identified by the sign ⚠ have special characteristics important for safety. When replacing any of these components, use only the specified parts.
3. **SPECIAL NOTE**
   All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this service manual.
4. **Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied. And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.**
5. **Parts different in shape or size may be used. However, only interchangeable parts will be supplied as service replacement parts.**
6. **All of parts are supplied from MKI.**
7. **Item numbers with capital letter E (Example: E10, E20, ...) in the Ref. No. column are shown in the exploded views.**
8. **Parts whose Ref. Nos. are the same are interchangeable as replacement parts. Any of these parts may be ordered and used as a replacement part.**

11.1.2. Mechanical Replacement Notes

1. **Section No. of parts shown in Exploded Views are indicated in the Remarks column.**
2. **The Mechanical Chassis Sub Ass'y (Ref. No. 4) consists of all the mechanical parts except the Cylinder Unit (Ref. No. 11) and the Cassette Up Ass'y (Ref. No. 61).**
   After replacing the Mechanical Chassis Sub Ass'y, be sure to perform "TAPE INTERCHANGEABILITY ADJUSTMENT" in MECHANICAL ADJUSTMENT procedures.
3. **In early units, a washer is used.**
   When servicing the washer or the P5 Arm Unit, replace only the P5 Arm Unit with a new one, and remove the washer.
4. **Main Cam Gear is supplied as a Main Cam Gear Kit (Ref. No. 8) only.**

Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut. However, Main Cam Push Nut is available separately as a replacement part.

5. The Capstan Motor Ass'y (Ref. No. 46) is supplied as a unit only. However, the Flat Flexible Cable (Ref. No. 48) is available separately as a replacement part.

6. The Infrared Remote Control Unit (Ref. No. 123) replacement part is available as a complete assembly unit only. Do not try to disassemble the Infrared Remote Control Unit. However, the battery cover is available separately as a replacement part.

7. Main Cam Push Nut (Ref. No. 414) is not reusable.
If removed, install a new one.

11.1.3. Electrical Replacement Notes

1. Unless otherwise specified;
All resistors are in Ω, K = 1,000 Ω, M = 1,000 kΩ.

2. Abbreviation

RTL:
Retention Time Limited
This indicates that the retention time is limited for this item. After the discontinuation of this item in production, it will no longer be available.

NR:
Non Repairable Board Ass'y

MGF CHIP:
Metal Glaze Film Chip

C CHIP:
Ceramic Chip

COMPLX CMP:
Complex Component

W FLMPRF:
Wirewound Flameproof

C.B.A.:
Circuit Board Assembly

P.C.B.:
Printed Circuit Board

E.S.D.:
Electrostatically Sensitive Devices

3. **When replacing 0 Ω resistor, a wire can be substituted for it.**
4. **Since the UHF/VHF TUNER/TV DEMODULATOR UNIT (Ref. No. 743) has already been pre-adjusted at the factory, do not try to adjust the UHF/VHF TUNER/TV DEMODULATOR UNIT. The UHF/VHF TUNER/TV DEMODULATOR UNIT replacement part is available as a complete assembly unit only.**
5. **EEP ROM IC (IC6005), MAIN C.B.A. replacement note:**
   After replacing EEP ROM IC (IC6005) or MAIN C.B.A., be sure to perform the "PG SHIFTER ADJUSTMENT" in ELECTRICAL ADJUSTMENT procedures.
6. **Microcontroller IC (IC6001) and EEP ROM IC (IC6005) replacement note for PV-V402, PV-V4022, and PV-V4522:**
   In early units, MN101D06FPK is used for Microcontroller IC (IC6001). In later units, MN101D09EPA is used for Microcontroller IC (IC6001). Please note that only MN101D09EPA is supplied as a replacement part for Microcontroller IC (IC6001) and this can be used with both types of EEP ROM IC (IC6005).
   When replacing EEP ROM IC (IC6005), be sure to confirm which type of Microcontroller IC (IC6001) is used on the unit you are servicing and install the proper part for EEP ROM IC (IC6005).

	Microcontroller IC (IC6001)	EEP ROM IC (IC6005)
Early Unit	MN101D06FPK	LSEQ0642
Later Unit	MN101D09EPA	KS24C011CS or AT24C01A10SI or C0ZBZ0000015 or C3EBCC000038 or KS24C011IS or M24C01-MN6

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D

11.2. MECHANICAL REPLACEMENT PARTS LIST

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D

MECHANICAL REPLACEMENT PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	VBSS0033	FULL ERASE HEAD	1
2	LSXK0094	MOTOR BLOCK UNIT	1
3	LSDB0045	TENSION ARM BOSS	1
4	LSXY0278	MECHANICAL CHASSIS SUB ASS'Y (A,B)	1,2
4	LSXY0279	MECHANICAL CHASSIS SUB ASS'Y (C,D)	1,2
5	LSMD0209	OPENER PIECE	1
8	VVGS0009	MAIN CAM GEAR KIT	2
9	LSDR0004	S REEL TABLE	1
10	LSDR0005	T REEL TABLE	1
11	LSEG0014	CYLINDER UNIT (A,B)	1
11	LSEG0015	CYLINDER UNIT (C,D)	1
12	VEHS0596	AUDIO CONTROL/ERASE HEAD UNIT (A,B)	1
12	VEHS0598	AUDIO CONTROL/ERASE HEAD UNIT (C,D)	1
14	LSDG0112	LIFT GEAR	1
16	VXDS0213	LOADING POST BASE-S UNIT	1
17	VXDS0214	LOADING POST BASE-T UNIT	1
18	LSXL0079	PINCH ARM UNIT	1
19	LSDG0110	INTERMEDIATE GEAR A	1
20	LSXL0078	P5 ARM UNIT	1
21	LSML0131	DRIVE RACK ARM	1
22	LSXL0077	TENSION CONTROL ARM UNIT	1
27	VXLS1130	T BRAKE UNIT	1
29	VXLS1129	TENSION ARM UNIT	1
32	VXLS1104	CLEANER ARM UNIT (A)	1
33	VDPS0269	CLEANER ROLLER (A)	1
35	LSKA0012	RUBBER FOOT	4
38	VMBS1161	CASSETTE DOOR SPRING	4
41	VXPS0389	CENTER CLUTCH UNIT	2
42	VMBS1151	CHANGING GEAR SPRING	2
43	LSDG0114	CHANGING GEAR	2
44	VXLS1091	IDLER ARM UNIT	2
46	LSEM0056	CAPSTAN MOTOR ASS'Y	2
47	LSMM0003	MAIN ROD	2
48	LSJW0027	FLEXIBLE FLAT CABLE W/OUT PLUG	2
49	VXLS1099	S LOADING ARM UNIT	2
50	VXLS1098	T LOADING ARM UNIT	2
51	LSDG0116	REEL GEAR	2
52	LSDG0111	INTERMEDIATE GEAR B	2
53	LSMA0532	SUPPORT ANGLE	2
54	LSDV0009	CAPSTAN BELT SQUARE,ELASTOMER 2MM	2
56	LSPF0056	SHEET,POLYETHYLENE	5
58	LSXL0081	SS BRAKE ARM UNIT	2
59	LSMB0196	SS BRAKE SPRING	2
61	VXYS1347	CASSETTE UP ASS'Y	3,4
62	LSMA0352	TOP PLATE	3
64	LSMD0174	SIDE PLATE L	3

Ref. No.	Part No.	Part Name & Description	Remarks
65	LSMD0173	SIDE PLATE R	3
66	LSMB0218	SUPPORT SPRING	3
67	LSML0096	OPENER LEVER	3
68	VXLS1111	DRIVE RACK UNIT	3
69	VXAS4423	HOLDER UNIT	3
70	VXLS1110	WIPER ARM UNIT	3
71	VYPS7125	FRONT PANEL ASS'Y (A)	4
71	VYPS7118	FRONT PANEL ASS'Y (B)	4
71	VYPS7117	FRONT PANEL ASS'Y (C)	4
71	VYPS7115	FRONT PANEL ASS'Y (D)	4
72	VYPS7084	CASSETTE DOOR-LID UNIT (A)	4
72	VYPS7112	CASSETTE DOOR-LID UNIT (B)	4
72	VYPS7113	CASSETTE DOOR-LID UNIT (C,D)	4
73	LSKM0521	TOP COVER (A,B,C)	4
73	LSKM0559	TOP COVER (D)	4
75	LSGP0244	REAR PANEL (A,B)	4
75	LSGP0243	REAR PANEL (C,D)	4
100	LSKF0322	BATTERY COVER (A,B,C)	5
100	VKFS2235	BATTERY COVER (D)	5
121	LSPG1264	PACKING CASE,PAPER (A)	5
121	LSPG1212	PACKING CASE,PAPER (B)	5
121	LSPG1213	PACKING CASE,PAPER (C)	5
121	LSPG1214	PACKING CASE,PAPER (D)	5
122	LSQF0532	FAN BAG (A)	5
122	LSQF0507	FAN BAG (B,C)	5
122	LSQF0508	FAN BAG (D)	5
123	LSSQ0263	INFRARED REMOTE CONTROL UNIT (A,B)	5
123	LSSQ0264	INFRARED REMOTE CONTROL UNIT (C)	5
123	LSSQ0313	INFRARED REMOTE CONTROL UNIT (D)	5
124	LSJA0372	VHF CONNECTING CABLE W/PLUG,0V	5
124	LSJA0274	VHF CONNECTING CABLE W/PLUG,0V	5
124	LSJA0328	VHF CONNECTING CABLE W/PLUG,0V	5
124	VJAS0212	VHF CONNECTING CABLE W/PLUG,0V	5
125	LSPN0209	FRONT CUSHION,STYROFOAM (A,B,C)	5
125	LSPN0169	FRONT CUSHION,STYROFOAM (D)	5
126	LSPN0210	REAR CUSHION,STYROFOAM (A,B,C)	5
126	LSPN0152	REAR CUSHION,STYROFOAM (D)	5
128	N9ZZ00000027	SECURITY TAG (B,C)	5
269	LSSC0425	GROUNDING PLATE	4
270	LSSC0426	GROUNDING PLATE	4
271	LSGQ0041	CUSHION,PLASTIC (D)	4
401	VHDS0475	SCREW,STEEL	1
410	VHDS0498	SCREW W/WASHER,STEEL	1
414	VHNS0070	MAIN CAM PUSH NUT,STEEL	2
422	XWGV2D5G	WASHER,NYLON	2
447	VHDS0310	SCREW,STEEL	4
460	XTN4+12A	TAPPING SCREW,STEEL	4
461	VHDS0460	SCREW,STEEL	4
473	XYN26+C6	SCREW W/WASHER,STEEL	1
475	XTV26+5FJ	TAPPING SCREW,STEEL	2
478	VHDS0495	SCREW,STEEL	2
501	LSHD0074	SCREW,STEEL	4
502	LSHD0075	TAPPING SCREW,STEEL	4
508	XTB26+6J	TAPPING SCREW,STEEL	2
711	LSSZ0004	INFRARED RECEIVER UNIT	4
716	B3CKS0000001	LED DISPLAY PANEL	4

Ref. No.	Part No.	Part Name & Description	Remarks
741	LSJA0360	AC CORD W/PLUG,AC 120V	4 ⚠
741	LSJA0358	AC CORD W/PLUG,AC 120V	4 ⚠
741	LSJA0359	AC CORD W/PLUG,AC 120V	4 ⚠
741	LSJA0361	AC CORD W/PLUG,AC 120V	4 ⚠
741	LSJA0348	AC CORD W/PLUG,AC 120V	4 ⚠
743	ENG56717G1	TUNER,UHF/VHF NR	4
771	EYF52BC	FUSE HOLDER	4
E10	LSEP2006GB	MAIN C.B.A. (A)	4 RTL
E10	LSEP2006GA	MAIN C.B.A. (B)	4 RTL
E10	LSEP2006HA	MAIN C.B.A. (C)	4 RTL
E10	LSEP2006HC	MAIN C.B.A. (D)	4 RTL

SERVICE FIXTURES AND TOOLS

Ref. No.	Part No.	Part Name & Description	Remarks
	VFMS0003H6	VHS ALIGNMENT TAPE	
	VFKS0081	GREASE	
	VFK0329	POST ADJUSTMENT DRIVER	
	VFK27	HEAD CLEANING STICK	
	VFK0330	H-POSITION ADJUSTMENT DRIVER	

11.3. ELECTRICAL REPLACEMENT PARTS LIST

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D

PRINTED CIRCUIT BOARD ASSEMBLY

Ref. No.	Part No.	Part Name & Description	Remarks
E10	LSEP2006GB	MAIN C.B.A. (A)	E.S.D. RTL
E10	LSEP2006GA	MAIN C.B.A. (B)	E.S.D. RTL
E10	LSEP2006HA	MAIN C.B.A. (C)	E.S.D. RTL
E10	LSEP2006HC	MAIN C.B.A. (D)	E.S.D. RTL

11.3.1. MAIN C.B.A.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name & Description	Remarks
IC1001	0N3131-R.KT	IC, LINEAR	⚠
IC1001	PS2501-1-X	IC, LINEAR	⚠
IC1001	0N3131-S.KT	IC, LINEAR	⚠
IC1002	TA76431ASTP6	IC, LINEAR	
IC1002	C0DAEMZ00001	IC, LINEAR	
IC3001	NN13400A	IC, LINEAR	
IC3101	MN3885S	IC, LINEAR	
IC3801	AN3275SB-E1	IC, LINEAR (D)	
IC4151	C0JBAR000292	IC, CMOS STANDARD LOGIC (A,B)	E.S.D.
IC4151	CD4053BCM	IC, CMOS STANDARD LOGIC (A,B)	E.S.D.
IC4151	C0JBAR000338	IC, CMOS STANDARD LOGIC (A,B)	E.S.D.
IC4201	AN3663FBP-V	IC, LINEAR (C,D)	
IC6001	MN101D09EPA	IC, 8BIT MICROCONTROLLER (A,B,C) *See Replacement Note	E.S.D.
IC6001	MN101D06FPL	IC, 8BIT MICROCONTROLLER (D)	E.S.D.
IC6002	B3NAA0000049	PHOTO INTERRUPUTER	
IC6003	B3NAA0000049	PHOTO INTERRUPUTER	
IC6004	C0EBJ0000080	IC, CMOS STANDARD LOGIC	E.S.D.
IC6004	C0EBJ0000099	IC, CMOS STADNARD LOGIC	E.S.D.
IC6004	RN5VS47CA-TR	IC ,CMOS STANDARD LOGIC	E.S.D.
IC6005	LSEQ0642	IC, 1K EEP ROM (A,B,C) *See Replacement Note	E.S.D.
IC6005	KS24C011CS	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	AT24C01A10SI	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	C0ZBZ0000015	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	C3EBCC000038	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	KS24C011IS	IC, 1K EEP ROM *See Replacement Note	E.S.D.
IC6005	M24C01-MN6	IC, 1K EEP ROM *See Replacement Note	E.S.D.

TRANSISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
Q1001	2SC4533LP.KT	TRANSISTOR SI NPN	⚠
Q1001	2SC4953LP.KT	TRANSISTOR SI NPN	⚠
Q1001	2SC5130LF608	TRANSISTOR SI NPN	⚠
Q1002	2SD1458	TRANSISTOR SI NPN	
Q1002	2SD225900A	TRANSISTOR SI NPN	
Q1051	2SD2159-T	TRANSISTOR SI NPN	
Q1051	2SD1581-T	TRANSISTOR SI NPN	
Q1052	2SD601A-RS	TRANSISTOR SI NPN CHIP	
Q1052	B1ABCF000011	TRANSISTOR SI NPN CHIP	
Q1053	2SD235800A	TRANSISTOR SI NPN CHIP	
Q1053	B1AAQB000002	TRANSISTOR SI NPN CHIP	
Q3001	2SB0709A0L	TRANSISTOR SI PNP CHIP	
Q3001	B1ADCF000001	TRANSISTOR SI PNP CHIP	
Q3002	2SB709A-RS	TRANSISTOR SI PNP CHIP	
Q3002	B1ADCF000001	TRANSISTOR SI PNP CHIP	
Q3003	2SD601A-RS	TRANSISTOR SI NPN CHIP	
Q3003	B1ABCF000011	TRANSISTOR SI NPN CHIP	
Q3875	2SB0709A0L	TRANSISTOR SI PNP CHIP (D)	
Q3875	B1ADCF000001	TRANSISTOR SI PNP CHIP (D)	
Q4001	2SB1218ARS	TRANSISTOR SI PNP CHIP	
Q4001	B1ADCF000063	TRANSISTOR SI PNP CHIP	
Q4002	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q4003	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q4101	2SD601A-RS	TRANSISTOR SI NPN CHIP	
Q4101	B1ABCF000011	TRANSISTOR SI NPN CHIP	

Ref. No.	Part No.	Part Name & Description	Remarks
Q4151	UNR521200L	TRANSISTOR SI NPN CHIP (A,B)	
Q4151	B1GBCFLL0012	TRANSISTOR SI NPN CHIP (A,B)	
Q4151	MUN5212T1	TRANSISTOR SI NPN CHIP (A,B)	
Q6001	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q6001	B1ABCF000020	TRANSISTOR SI NPN CHIP	
Q6002	2SB709A-RS	TRANSISTOR SI PNP CHIP	
Q6002	B1ADCF000001	TRANSISTOR SI PNP CHIP	
Q6003	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q6003	B1ABCF000020	TRANSISTOR SI NPN CHIP	
Q6005	2SB709A-RS	TRANSISTOR SI PNP CHIP	
Q6005	B1ADCF000001	TRANSISTOR SI PNP CHIP	
Q6006	2SD1819A-RS	TRANSISTOR SI NPN CHIP	
Q6006	B1ABCF000020	TRANSISTOR SI NPN CHIP	
Q6009	VEKS5707	PHOTO SENSOR UNIT	
Q6010	VEKS5707	PHOTO SENSOR UNIT	

DIODES

Ref. No.	Part No.	Part Name & Description	Remarks
D1001	DB105G	DIODE SI	⚠
D1001	B0EBKR000003	DIODE SI	⚠
D1001	B0EBKR000020	DIODE SI	⚠
D1002	B0HAHP000014	DIODE SI	
D1002	B0HAJP000007	DIODE SI	
D1002	B0HAMP000061	DIODE SI	
D1003	B0HAHP000014	DIODE SI	
D1003	B0HAJP000007	DIODE SI	
D1003	B0HAMP000061	DIODE SI	
D1005	B0HAHP000014	DIODE SI	
D1005	B0HAJP000007	DIODE SI	
D1005	B0HAMP000061	DIODE SI	
D1006	ERB32-01L3	DIODE SI	
D1006	B0HAML000013	DIODE SI	
D1006	B0HAML000014	DIODE SI	
D1006	RGP15GL-5008	DIODE SI	
D1008	ERB81-004V1	DIODE SI	
D1008	B0JAME000049	DIODE SI	
D1008	B0JANE000011	DIODE SI	
D1009	B0JCME000028	DIODE SI	
D1009	B0JCMD000006	DIODE SI	
D1009	B0JCMD000014	DIODE SI	
D1009	MA2YD2300L	DIODE SI	
D1009	SFPJ-53	DIODE SI	
D1015	MA2180LA	DIODE ZENER 18V	⚠
D1015	1N4746A-T	DIODE ZENER 18V	⚠
D1015	1N4746ARL	DIODE ZENER 18V	⚠
D1016	MA2C165001VT	DIODE SI	
D1016	B0AACK000004	DIODE SI	
D1016	1SS119	DIODE SI	
D1017	B0AAML000001	DIODE SI	
D1017	ERA15-01V3	DIODE SI	
D1051	MA4110N-H	DIODE ZENER 11V	
D3006	MAZ40510MF	DIODE ZENER 5.1V	
D3006	HZS5C2TD	DIODE ZENER 5.1V	
D3006	HZS5C3TD	DIODE ZENER 5.1V	
D3007	MAZ40510MF	DIODE ZENER 5.1V	
D3007	HZS5C2TD	DIODE ZENER 5.1V	
D3007	HZS5C3TD	DIODE ZENER 5.1V	
D4209	MA2C165001VT	DIODE SI (C,D)	
D4209	B0AACK000004	DIODE SI (C,D)	
D4209	1SS119	DIODE SI (C,D)	
D6001	VEKS5708	SENSOR LED UNIT	
D6003	MA2C165001VT	DIODE SI	
D6003	B0AACK000004	DIODE SI	
D6003	1SS119	DIODE SI	

RESISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
R1001	VRESC2TK275	CARBON 1/2W 2.7M	⚠
R1001	VRESC2TK275C	CARBON 1/2W 2.7M	⚠
R1001	VRESC2TK275T	CARBON 1/2W 2.7M	⚠
R1003	D0AF334JA038	CARBON 1/2W 330K	
R1004	ERG2SJ333H	METAL OXIDE 2W 33K	
R1005	ERG1SJ560P	METAL OXIDE 1W 56	
R1006	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1007	ERDS2TJ101	CARBON 1/4W 100	
R1008	ERDS2TJ392	CARBON 1/4W 3.9K	
R1010	ERD25FJ100P	CARBON 1/4W 10	⚠
R1010	ERD25FPJ100P	CARBON 1/4W 10	⚠
R1010	VRESF4FJ100P	CARBON 1/4W 10	⚠
R1014	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R1015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1016	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R1017	D1BD2431A016	MGF CHIP 2.43 K	
R1018	D0HD222ZA002	MGF CHIP 2.2K	
R1019	ERDS2T0	CARBON 1/4W 0	
R1025	ERDS2TJ300	CARBON 1/2W 30	
R1026	ERDS2TJ300	CARBON 1/2W 30	
R1051	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R1052	ERDS2TJ153	CARBON 1/4W 15K	
R1053	ERDS2TJ153	CARBON 1/4W 15K	
R1057	ERDS2TJ331	CARBON 1/4W 330	
R1058	ERDS2TJ104	CARBON 1/4W 100K	
R3001	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3002	ERDS2TJ561	CARBON 1/4W 560	
R3003	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3004	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3006	ERDS2TJ152	CARBON 1/4W 1.5K	
R3007	ERDS2TJ152	CARBON 1/4W 1.5K	
R3008	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3009	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3022	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3023	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3027	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R3029	ERJ6GEYJ125V	MGF CHIP 1/10W 1.2M	
R3031	ERJ6GEYJ474V	MGF CHIP 1/10W 470K	
R3033	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3034	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R3035	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R3036	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R3041	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3301	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3302	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3305	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3803	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (D)	
R3807	ERJ6GEYJ393V	MGF CHIP 1/10W 39K (D)	
R3810	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (D)	
R3811	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (D)	
R3812	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (D)	
R3813	ERJ6GEYJ563V	MGF CHIP 1/10W 56K (D)	
R3822	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (D)	
R3874	ERJ6GEYJ471V	MGF CHIP 1/10W 470 (D)	
R3875	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K (D)	

Ref. No.	Part No.	Part Name & Description	Remarks
R4001	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4002	ERJ6GEYJ334V	MGF CHIP 1/10W 330K	
R4003	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R4004	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4005	ERJ6GEYJ225V	MGF CHIP 1/10W 2.2M	
R4006	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R4007	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R4008	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R4009	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (A,B)	
R4010	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (A,B)	
R4010	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (C,D)	
R4011	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4012	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4013	ERJ6GEYJ331V	MGF CHIP 1/10W 330 (A,B)	
R4014	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R4015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R4017	ERJ6GEYJ101V	MGF CHIP 1/10W 100 (A,B)	
R4017	ERJ6GEYJ102V	MGF CHIP 1/10W 1K (C,D)	
R4018	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K (A,B)	
R4028	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R4102	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4103	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R4151	ERJ6GEYJ101V	MGF CHIP 1/10W 100 (A,B)	
R4152	ERJ6GEYJ101V	MGF CHIP 1/10W 100 (A,B)	
R4153	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A,B)	
R4154	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A,B)	
R4155	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A,B)	
R4156	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A,B)	
R4157	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A,B)	
R4158	ERJ6GEYJ104V	MGF CHIP 1/10W 100K (A,B)	
R4161	ERJ6GEYJ223V	MGF CHIP 1/10W 22K (A,B)	
R4201	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (C,D)	
R4202	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (C,D)	
R4203	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K (C,D)	
R4204	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K (C,D)	
R4205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (C,D)	
R4206	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (C,D)	
R4207	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K (C,D)	
R4208	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K (C,D)	
R4209	ERJ6GEYJ102V	MGF CHIP 1/10W 1K (C,D)	
R4210	ERJ6GEYJ102V	MGF CHIP 1/10W 1K (C,D)	
R4213	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (C,D)	
R4214	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (C,D)	
R4218	ERJ6GEYJ102V	MGF CHIP 1/10W 1K (C,D)	
R4223	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (C,D)	
R4224	ERJ6GEYJ333V	MGF CHIP 1/10W 33K (C,D)	
R4225	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (C,D)	
R4226	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K (C,D)	
R4228	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (C,D)	
R4453	ERJ6GEYJ333V	MGF CHIP 1/10W 33K (C,D)	
R4455	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K (C,D)	
R6001	ERDS2TJ101	CARBON 1/4W 100	
R6003	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R6005	ERJ6GEYJ563V	MGF CHIP 1/10W 56K	
R6006	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6007	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6008	ERJ6GEYJ223V	MGF CHIP 1/10W 22K (A,B,C)	

Ref. No.	Part No.	Part Name & Description	Remarks
R6010	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6012	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6019	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6024	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6026	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6027	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R6028	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6029	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R6030	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6033	ERDS2TJ681	CARBON 1/4W 680	
R6037	ERJ6GEYJ391V	MGF CHIP 1/10W 390	
R6052	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6057	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6059	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6060	ERJ6GEYJ105V	MGF CHIP 1/10W 1M	
R6062	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6063	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6064	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6066	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6069	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6070	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6071	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6072	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6073	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6074	ERDS2TJ272	CARBON 1/4W 2.7K	
R6075	ERJ6GEYJ223V	MGF CHIP 1/10W 22K (A,B,C)	
R6078	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6080	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6082	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6085	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6086	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6087	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6109	ERJ6GEYJ183V	MGF CHIP 1/10W 18K	
R6110	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6115	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6116	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6202	ERJ6GEYJ274V	MGF CHIP 1/10W 270K	
R6203	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6204	ERJ6GEYJ334V	MGF CHIP 1/10W 330K	
R6205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6228	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R6231	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6232	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R6233	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6234	ERJ6GEYJ103V	MGF CHIP 1/10W 10K (D)	
R6236	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6237	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6238	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6239	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6301	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R6302	ERDS2TJ3R3	CARBON 1/4W 3.3	
R6303	ERDS2TJ470	CARBON 1/4W 47	
R6310	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6311	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R6313	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6314	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R6315	ERJ6GEYJ123V	MGF CHIP 1/10W 12K	

Ref. No.	Part No.	Part Name & Description	Remarks
R6316	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6317	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R6319	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6320	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R6321	ERJ6GEYJ123V	MGF CHIP 1/10W 12K	
R6521	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R7001	ERJ6GEYJ473V	MGF CHIP 1/10W 47K (A,B)	

CAPACITORS

Ref. No.	Part No.	Part Name & Description	Remarks
C1001	ECKATS103MF	CERAMIC 250V 0.01UF	⚠
C1001	ECKETS103MF	CERAMIC 125V 0.01UF	⚠
C1001	VCKST3G103MY	CERAMIC 250V 0.01UF	⚠
C1001	VCKSU3D103MY	C CHIP 125V 0.01UF	⚠
C1002	ECKATS332ME8	CERAMIC 250V 3300PF	⚠
C1002	ECKDNB332ME8	CERAMIC 125V 3300PF	⚠
C1002	ECKETS332ME8	CERAMIC 125V 3300PF	⚠
C1002	VCKST3G332MX	CERAMIC 250V 3300PF	⚠
C1002	VCKSU3D332MX	CERAMIC 125V 3300PF	⚠
C1003	ECKATS332ME8	CERAMIC 250V 3300PF	⚠
C1003	ECKDNB332ME8	CERAMIC 125V 3300PF	⚠
C1003	ECKETS332ME8	CERAMIC 125V 3300PF	⚠
C1003	VCKST3G332MX	CERAMIC 250V 3300PF	⚠
C1003	VCKSU3D332MX	CERAMIC 250V 3300PF	⚠
C1004	ECEA2DU820YE	ELECTROLYTIC 200V 82UF	⚠
C1004	F2A2D8200001	ELECTROLYTIC 220V 82UF	⚠
C1004	F2A2D8200003	ELECTROLYTIC 200V 82UF	⚠
C1004	VCESR2D820XE	ELECTROLYTIC 200V 82UF	⚠
C1005	ECA2DHG4R7B	ELECTROLYTIC 200V 4.7UF	
C1006	ECKR2H221KB5	CERAMIC 500V 220PF	
C1007	ECJ2VB1C224K	C CHIP 16V 0.22UF	
C1009	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1010	ECJ2VC1H101J	C CHIP 50V 100PF	
C1011	ECA1HHG4R7I	ELECTROLYTIC 50V 4.7UF	
C1012	ECEA1PEE331	ELECTROLYTIC 18V 330UF	
C1013	ECA1EM331B	ELECTROLYTIC 25V 330UF	
C1016	ECEA1PEE331	ELECTROLYTIC 18V 330UF	
C1017	ECA0JM102B	ELECTROLYTIC 6.3V 1000UF	
C1018	ECJ2VB1E104K	C CHIP 25V 0.1UF	
C1019	ECA0JM471	ELECTROLYTIC 6.3V 470UF	
C1027	ECKATS103MF	CERAMIC 250V 0.01UF	⚠
C1027	ECKETS103MF	CERAMIC 125V 0.01UF	⚠
C1027	VCKST3G103MY	CERAMIC 250V 0.01UF	⚠
C1027	VCKSU3D103MY	C CHIP 125V 0.01UF	⚠
C1029	ECJ2VC1H101J	C CHIP 50V 100PF	
C1030	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1051	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C1052	ECEA1CKA100	ELECTROLYTIC 16V 10UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C1058	ECEA0JEE101	ELECTROLYTIC 6.3V 100UF	
C1059	ECEA1CKA220	ELECTROLYTIC 16V 22UF	
C1060	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3001	ECA0JM471	ELECTROLYTIC 6.3V 470UF	
C3003	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C3004	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3014	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3015	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3017	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3018	ECJ2VC1H181J	C CHIP 50V 180PF	
C3019	ECJ2VC1H560J	C CHIP 50V 56PF	
C3021	ECJ2VF1C224Z	C CHIP 16V 0.22UF	
C3022	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3023	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3024	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3025	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3026	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3027	ECJ2VF1C224Z	C CHIP 16V 0.22UF	
C3028	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3029	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3030	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3031	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3032	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3033	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3034	ECJ2VF1C224Z	C CHIP 16V 0.22UF	
C3035	ECJ2VC1H680J	C CHIP 50V 68PF	
C3036	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3037	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C3038	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3039	ECJ2VB1H822K	C CHIP 50V 8200PF	
C3043	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3044	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3045	ECJ2VF1C474Z	C CHIP 16V 0.47UF	
C3047	ECJ2VC1H181J	C CHIP 50V 180PF	
C3048	ECJ2VC1H560J	C CHIP 50V 56PF	
C3049	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3050	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3051	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3052	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3053	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3054	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3055	ECJ2VB1H392K	C CHIP 50V 3900PF	
C3056	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3062	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3101	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3102	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3104	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3105	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3106	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C3108	ECJ2VB1H102K	C CHIP 50V 1000PF	
C3109	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3302	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3303	ECJ2VC1H121J	C CHIP 50V 120PF	
C3306	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3308	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3501	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3502	ECJ2VF1E104Z	C CHIP 25V 0.1UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C3503	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3504	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3505	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3506	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3507	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3508	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3514	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3515	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3517	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3518	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C3519	ECJ2VB1H102K	C CHIP 50V 1000PF	
C3801	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF (D)	
C3802	ECJ2VF1H103Z	C CHIP 50V 0.01UF (D)	
C3803	ECJ2VB1H332K	C CHIP 50V 3300PF (D)	
C3804	ECJ2VF1E104Z	C CHIP 25V 0.1UF (D)	
C3805	ECJ2VF1H103Z	C CHIP 50V 0.01UF (D)	
C3806	ECJ2VB1H392K	C CHIP 50V 3900PF (D)	
C3807	ECJ2VB1H103K	C CHIP 50V 0.01UF (D)	
C3808	ECJ2VB1E104K	C CHIP 25V 0.1UF (D)	
C3811	ECJ2VB1H103K	C CHIP 50V 0.01UF (D)	
C3812	ECJ2VB1H102K	C CHIP 50V 1000PF (D)	
C3815	ECJ2VB1E104K	C CHIP 25V 0.1UF (D)	
C3816	ECUV1E154KBN	C CHIP 25V 0.15UF (D)	
C3817	ECJ2VB1H103K	C CHIP 50V 0.01UF (D)	
C3818	ECJ2VB1H103K	C CHIP 50V 0.01UF (D)	
C3819	ECJ2VB1H103K	C CHIP 50V 0.01UF (D)	
C3820	ECJ2VF1E104Z	C CHIP 25V 0.1UF (D)	
C3821	ECJ2VC1H390J	C CHIP 50V 39PF (D)	
C3822	ECEA1HKA010	ELECTROLYTIC 50V 1UF (D)	
C3825	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF (D)	
C3826	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF (D)	
C3828	ECJ2VC1H101J	C CHIP 50V 100PF (D)	
C3830	ECJ2VB1E563K	C CHIP 25V 0.056UF (D)	
C4001	ECJ2VF1C224Z	C CHIP 16V 0.22UF	
C4002	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4003	ECJ2VB1H272K	C CHIP 50V 2700PF	
C4004	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C4005	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C4006	ECJ2VB1H102K	C CHIP 50V 1000PF	
C4007	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C4008	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C4009	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4010	ECJ2VB1E273K	C CHIP 25V 0.027UF	
C4011	ECJ2VB1H822K	C CHIP 50V 8200PF	
C4012	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4013	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4014	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4017	ECJ2VB1H103K	C CHIP 50V 0.01UF (C,D)	
C4018	ECEA1HKA010	ELECTROLYTIC 50V 1UF (A,B)	
C4102	ECQB1562JF	POLYESTER 100V 5600PF	
C4103	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C4104	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C4106	ECEA1CKA220	ELECTROLYTIC 16V 22UF	
C4151	ECEA1HKA010	ELECTROLYTIC 50V 1UF (A,B)	
C4152	ECEA1HKA010	ELECTROLYTIC 50V 1UF (A,B)	
C4153	ECEA1HKA010	ELECTROLYTIC 50V 1UF (A,B)	
C4154	ECEA1CKA101	ELECTROLYTIC 16V 100UF (A,B)	

Ref. No.	Part No.	Part Name & Description	Remarks
C4155	ECJ2VF1E104Z	C CHIP 25V 0.1UF (A,B)	
C4201	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF (C,D)	
C4202	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF (C,D)	
C4203	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF (C,D)	
C4204	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF (C,D)	
C4205	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4206	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4207	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4208	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4209	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4210	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4211	ECJ2VB1H153K	C CHIP 50V 0.015UF (C,D)	
C4212	ECJ2VB1H153K	C CHIP 50V 0.015UF (C,D)	
C4213	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4214	ECEA1CKA101	ELECTROLYTIC 16V 100UF (C,D)	
C4216	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4217	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF (C,D)	
C4218	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4219	ECEA1HKA010	ELECTROLYTIC 50V 1UF (C,D)	
C4227	ECJ2VF1C224Z	C CHIP 16V 0.22UF (C,D)	
C4229	ECJ2VF1H103Z	C CHIP 50V 0.01UF (C,D)	
C4230	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF (C,D)	
C4451	ECJ2VB1H103K	C CHIP 50V 0.01UF (C,D)	
C4452	ECJ2VB1H103K	C CHIP 50V 0.01UF (C,D)	
C4455	ECJ2VB1E104K	C CHIP 25V 0.1UF (C,D)	
C4456	ECJ2VB1E104K	C CHIP 25V 0.1UF (C,D)	
C4459	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF (C,D)	
C4901	ECEA1HKA010	ELECTROLYTIC 50V 1UF (C,D)	
C4902	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF (C,D)	
C4903	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF (C,D)	
C4904	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF (C,D)	
C4905	ECEA1CKA100	ELECTROLYTIC 16V 10UF (C,D)	
C4906	ECEA1HKA010	ELECTROLYTIC 50V 1UF (C,D)	
C4911	ECJ2VB1E223K	C CHIP 25V 0.022UF (C,D)	
C4912	ECJ2VB1E104K	C CHIP 25V 0.1UF (C,D)	
C4913	ECJ2VB1H103K	C CHIP 50V 0.01UF (C,D)	
C4917	ECJ2VB1E104K	C CHIP 25V 0.1UF (C,D)	
C4918	ECJ2VB1E104K	C CHIP 25V 0.1UF (C,D)	
C4919	ECJ2VB1E104K	C CHIP 25V 0.1UF (C,D)	
C4920	ECJ2VB1E223K	C CHIP 25V 0.022UF (C,D)	
C6001	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6003	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6005	ECJ2VC1H100C	C CHIP 50V 10PF	
C6006	ECJ2VC1H090C	C CHIP 50V 9PF	
C6019	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C6021	ECJ2VF1H103Z	C CHIP 50V 0.01UF	
C6026	ECJ2VB1H102K	C CHIP 50V 1000PF	
C6027	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6033	ECJ2VF1H104Z	C CHIP 50V 0.1UF	
C6201	ECJ2VB1H332K	C CHIP 50V 3300PF	
C6202	ECJ2VB1H102K	C CHIP 50V 1000PF	
C6203	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C6204	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C6216	ECJ2VB1H103K	C CHIP 50V 0.01UF (D)	
C6217	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6218	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C6221	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C6223	ECJ2VB1H103K	C CHIP 50V 0.01UF	
C6224	VCESAM0J331I	ELECTROLYTIC 6.3V 330UF	
C6228	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6231	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C6232	ECA1HM470I	ELECTROLYTIC 50V 47UF	
C6233	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C6302	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6303	ECJ2VF1E104Z	C CHIP 25V 0.1UF	
C6304	VCESAM0J331I	ELECTROLYTIC 6.3V 330UF	
C6307	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C7001	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C7005	ECJ2VB1E183K	C CHIP 25V 0.018UF (A,B)	
C7010	ECJ2VB1H102K	C CHIP 50V 1000PF	

COILS

Ref. No.	Part No.	Part Name & Description	Remarks
L1001	ELF15N005A	LINE FILTER 0.5A 18MH	⚠
L1001	ELF18D290A	LINE FILTER 0.5A 18MH	⚠
L1001	G0B183D00001	LINE FILTER 0.5A 18MH	⚠
L1001	J0HBLD000001	LINE FILTER 0.5A 18MH	⚠
L1001	VLQS0167	LINE FILTER 0.5A 18MH	⚠
L1001	VLQS0170	LINE FILTER 0.6A 18MH	⚠
L1002	VLQSAB7D220K	COIL 22UH	
L1003	VLQSAB7D100K	COIL 10UH	
L1006	J0JHB0000021	FILTER	
L3001	ELESN470KA	COIL 47UH	
L3014	G0C330KA0045	COIL 33UH	
L3016	ELESN330KA	COIL 33UH	
L3018	ELESN470KA	COIL 47UH	
L3101	ELESN101KA	COIL 100UH	
L3506	ELESN101KA	COIL 100UH	
L3507	ELESN101KA	COIL 100UH	
L3801	ELESN101KA	COIL 100UH (D)	
L3802	ELESN470KA	COIL 47UH (D)	
L4001	ELELN153KA	COIL 15MH	
L4002	ELESN101KA	COIL 100UH	
L4101	ELESN471KA	COIL 470UH	
L4201	ELESN101KA	COIL 100UH (C,D)	
L4451	ELESN101KA	COIL 100UH (C,D)	
L6201	ELEXT101KE04	COIL 100UH	
L6302	ELESN470KA	COIL 47UH	
L7003	G0C101KA0045	COIL 100UH	

CRYSTAL OSCILLATOR

Ref. No.	Part No.	Part Name & Description	Remarks
X3010	VSXS0195	CRYSTAL OSCILLATOR	
X6001	VSXS0232-TB	CRYSTAL OSCILLATOR	

PIN HEADERS

Ref. No.	Part No.	Part Name & Description	Remarks
P3501	LSJWM6N050LL	CONNECTOR CABLE W/PLUG,DC 9V (A,B)	
P3501	LSJWM9N050LL	CONNECTOR CABLE W/PLUG,DC 9V (C,D)	
P3502	LSEK0407	SHIELD PLATE UNIT	
P4001	VJSS0888	FE CONNECTOR 2P	
P4002	LSJWM6N130LL	CONNECTOR CABLE W/PLUG,DC 9V	
P6201	K1KA12A00234	CONNECTOR 12P	

SWITCHES

Ref. No.	Part No.	Part Name & Description	Remarks
SW6001	LSSH0002	LEAF SWITCH-SAFETY TAB	
SW6002	LSSS0012	SWITCH MODE SELECT	
SW6301	EVQ11A09K	SWITCH PUSH (A)	
SW6303	EVQ11A09K	SWITCH PUSH	
SW6304	EVQ11A09K	SWITCH PUSH	
SW6305	EVQ11A09K	SWITCH PUSH	
SW6306	EVQ11A09K	SWITCH PUSH (D)	
SW6307	EVQ11A09K	SWITCH PUSH (A)	
SW6310	EVQ11A09K	SWITCH PUSH (B,C)	
SW6311	EVQ11A09K	SWITCH PUSH (B,C,D)	
SW6312	EVQ11A09K	SWITCH PUSH (A)	
SW6313	EVQ11A09K	SWITCH PUSH (A)	
SW6314	EVQ11A09K	SWITCH PUSH	
SW6315	EVQ11A09K	SWITCH PUSH (B,C,D)	
SW6316	EVQ11A09K	SWITCH PUSH (A)	
SW6317	EVQ11A09K	SWITCH PUSH (B,C,D)	

FUSE & PROTECTOR

Ref. No.	Part No.	Part Name & Description	Remarks
F1001	VSFS0003A16	FUSE 125V 1.6A	⚠
F1001	K5D162AB0003	FUSE 125V 1.6A	⚠
F1001	K5D162AQ0004	FUSE 125V 1.6A	⚠
PR1001	UNH000600A	IC PROTECTOR 1.5A	⚠
PR1001	B1ZAZ0000040	IC PROTECTOR 1.5A	⚠
PR1001	LSSF009A25E	IC PROTECTOR 1.5A	⚠
PR1002	UNH000600A	IC PROTECTOR 1.5A	⚠
PR1002	B1ZAZ0000040	IC PROTECTOR 1.5A	⚠
PR1002	LSSF009A25E	IC PROTECTOR 1.5A	⚠

TRANSFORMER

Ref. No.	Part No.	Part Name & Description	Remarks
T1001	ETS28AD2J3AC	SW TRANSFORMER	⚠
T1001	ETS28AD2J3NC	SW TRANSFORMER	⚠
T1001	LSTP0105	TRANSFORMER POWER	⚠
T1001	LSTP0105-1	TRANSFORMER	⚠
T1001	VTPS0042	SW TRANSFORMER	⚠
T1001	VTPS0042-1	SW TRANSFORMER	⚠
T4101	EIQ7QF018Q	OSC TRANSFORMER (A,B)	
T4101	LSLT0051	TRANSFORMER (C,D)	

JACKS

Ref. No.	Part No.	Part Name & Description	Remarks
JK3001	LSJH0028	AUDIO/VIDEO JACK SOCKET (A,B)	
JK3001	K2HA608B0002	Hi-Fi AUDIO/VIDEO JACK SOCKET (C,D)	
JK3002	LSJH0053	AUDIO/VIDEO JACK SOCKET (A)	
JK3002	K2HA104B0007	FRONT AUDIO/VIDEO JACK SOCKET (B)	
JK3002	K2HA306B0058	FRONT AUDIO/VIDEO JACK SOCKET (C,D)	

MISCELLANEOUS

Ref. No.	Part No.	Part Name & Description	Remarks
711	LSSZ0004	INFRARED RECEIVER UNIT	
716	B3CKS0000001	LED DISPLAY PANEL	
741	LSJA0360	AC CORD W/PLUG,AC 120V	⚠
741	LSJA0358	AC CORD W/PLUG,AC 120V	⚠
741	LSJA0359	AC CORD W/PLUG,AC 120V	⚠
741	LSJA0361	AC CORD W/PLUG,AC 120V	⚠
741	LSJA0348	AC CORD W/PLUG,AC 120V	⚠
743	ENG56717G1	TUNER,UHF/VHF NR	
771	EYF52BC	FUSE HOLDER	

12. SCHEMATIC DIAGRAMS FOR PRINTING WITH LETTER SIZE

7.2. MAIN SCHEMATIC DIAGRAMS

MAIN I (SYSTEM CONTROL/ SERVO) SCHEMATIC DIAGRAM

A

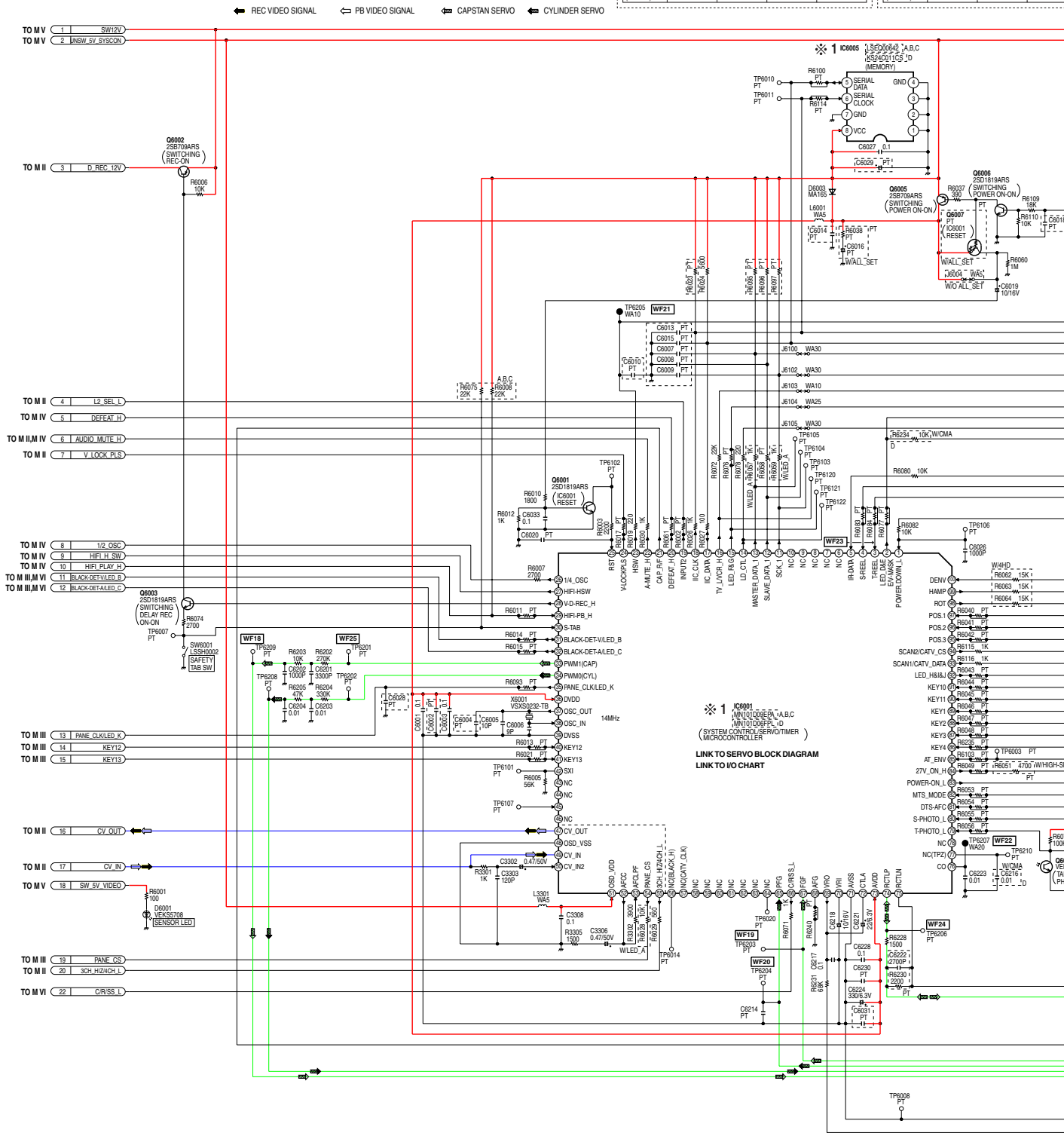
KEY VOLTAGE CHART (SW6301, 6303, 6304, 6305, 6307, 6312, 6313, 6314, 6316)

TERMINAL VOLTAGE	0V ~ 0.6V	0.7V ~ 1.9V	2.0V ~ 3.1V	3.2V ~ 4.4V
KEY DATA1 (PIN 89)	-----	REC	REW	-----
KEY DATA2 (PIN 88)	-----	PLAY	FF	-----
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	STOP/EJECT	CH UP	TV/VCR	POWER

B, C

KEY VOLTAGE CHART (SW6303, 6304, 6305, 6310, 631

TERMINAL VOLTAGE	0V ~ 0.6V	0.7V ~ 1.9V	2.0V ~ 3.
KEY DATA1 (PIN 89)	-----	REW	FF
KEY DATA2 (PIN 88)	-----	STOP/EJECT	PLAY
KEY DATA3 (PIN 87)	CH DOWN	-----	-----
KEY DATA4 (PIN 86)	REC	CH UP	-----



NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

❖1 Microcontroller IC (IC6001) and EEP ROM IC (IC6005) replacement note for PV-V402, PV-V4022, and PV-V4522:
In early units, MN101D06FPK is used for Microcontroller IC (IC6001).
In later units, MN101D09EPA is used for Microcontroller IC (IC6001).
Please note that only MN101D09EPA is supplied as a replacement part and this can be used with both types of EEP ROM IC (IC6005).
When replacing EEP ROM IC (IC6005), be sure to confirm which type of Microcontroller IC (IC6001) is used on the unit you are servicing and install the proper part for EEP ROM IC (IC6005).

	Microcontroller IC (IC6001)	EEPROM IC (IC6005)
Early Unit	MN101D06FPK	LSEQ0642
Later Unit	MN101D09EPA	KS24C011CS or AT24C01A10SI or C0ZBZ0000015 or C3EBCC000038 or KS24C011IS or M24C01-MN6

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT

C

KEY VOLTAGE CHART (SW6303, 6304, 6305, 6310, 6311, 6314, 6315, 6317)

TERMINAL VOLTAGE	0V ~ 0.6V	0.7V ~ 1.9V	2.0V ~ 3.1V	3.2V ~ 4.4V
KEY DATA1 (PIN 89)	-----	REW	FF	-----
KEY DATA2 (PIN 88)	-----	STOP/EJECT	PLAY	-----
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	REC	CH UP	-----	POWER

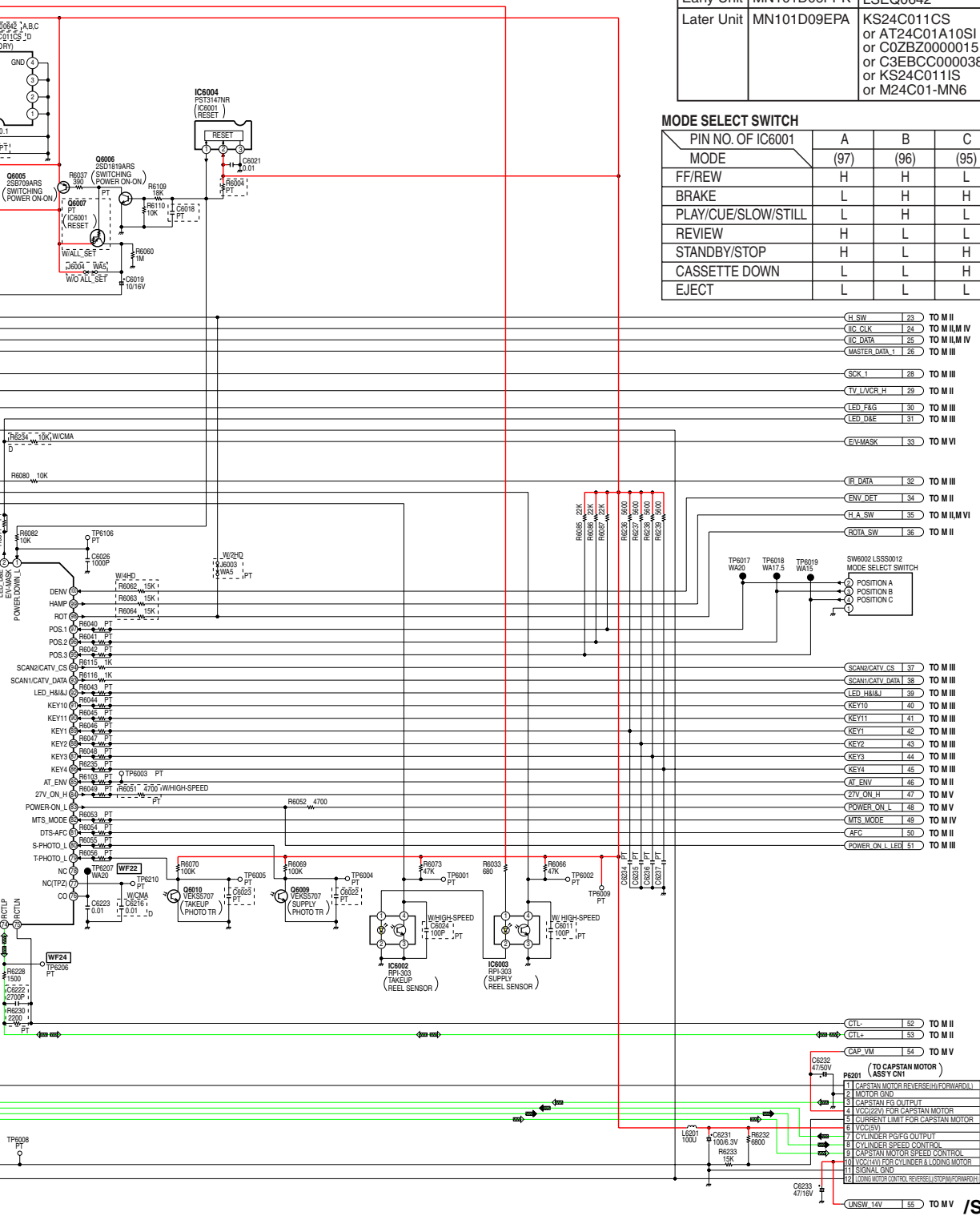
D

KEY VOLTAGE CHART (SW6303, 6304, 6305, 6306, 6311, 6314, 6315, 6317)

TERMINAL VOLTAGE	0V ~ 0.6V	0.7V ~ 1.9V	2.0V ~ 3.1V	3.2V ~ 4.4V
KEY DATA1 (PIN 89)	-----	-----	STOP/EJECT	-----
KEY DATA2 (PIN 88)	-----	REW	PLAY	FF
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	REC	CH UP	-----	POWER

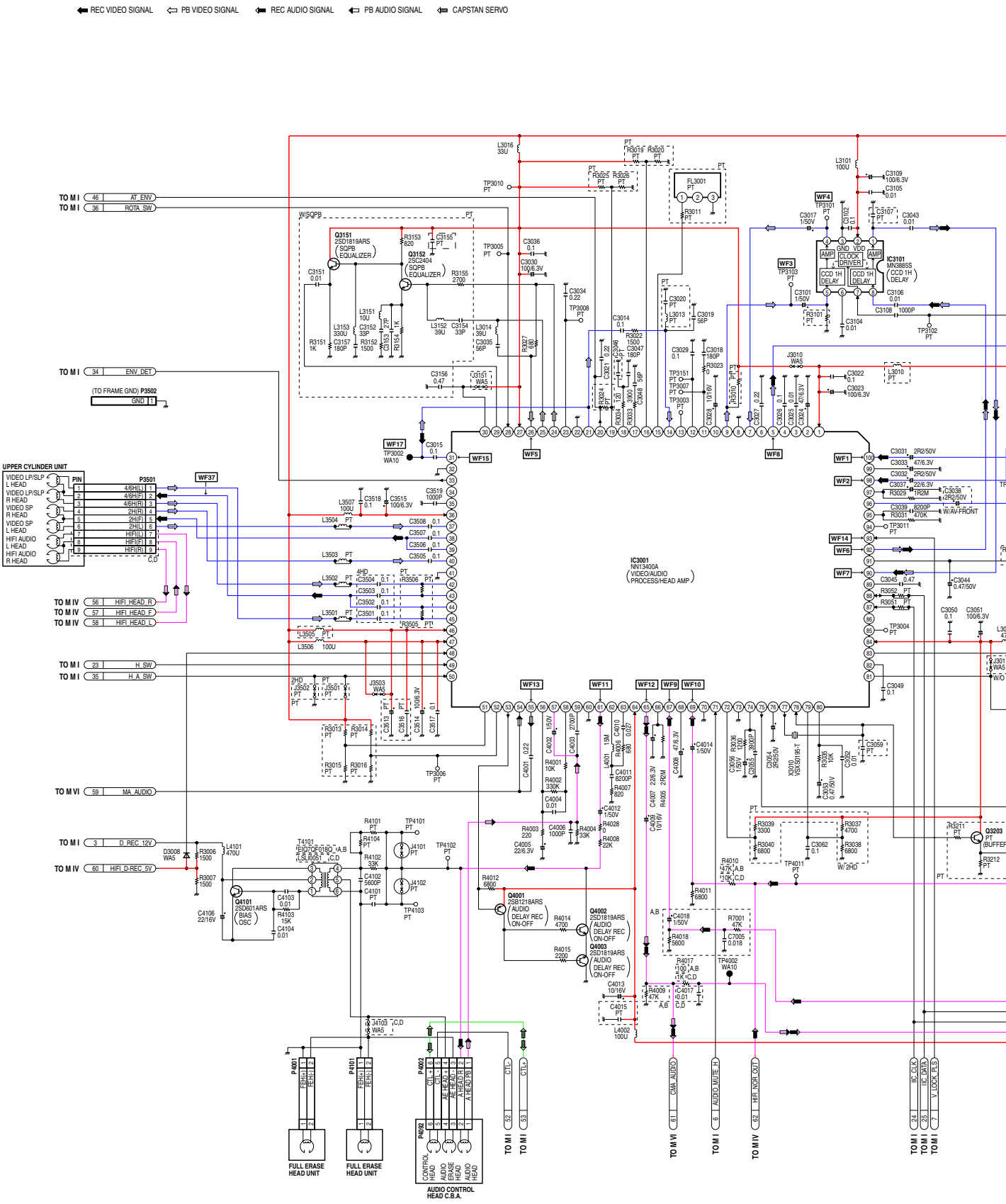
MODE SELECT SWITCH

PIN NO. OF IC6001 / MODE	A (97)	B (96)	C (95)
FF/REW	H	H	L
BRAKE	L	H	H
PLAY/CUE/SLOW/STILL	L	H	L
REVIEW	H	L	L
STANDBY/STOP	H	L	H
CASSETTE DOWN	L	L	H
EJECT	L	L	H



LSJB2006
PV-V402, PV-V4022, PV-V4522, PV-V4612
MAIN I (SYSTEM CONTROL /SERVO) SCHEMATIC DIAGRAM

MAIN II (SIGNAL PROCESS/AUDIO) SCHEMATIC DIAGRAM

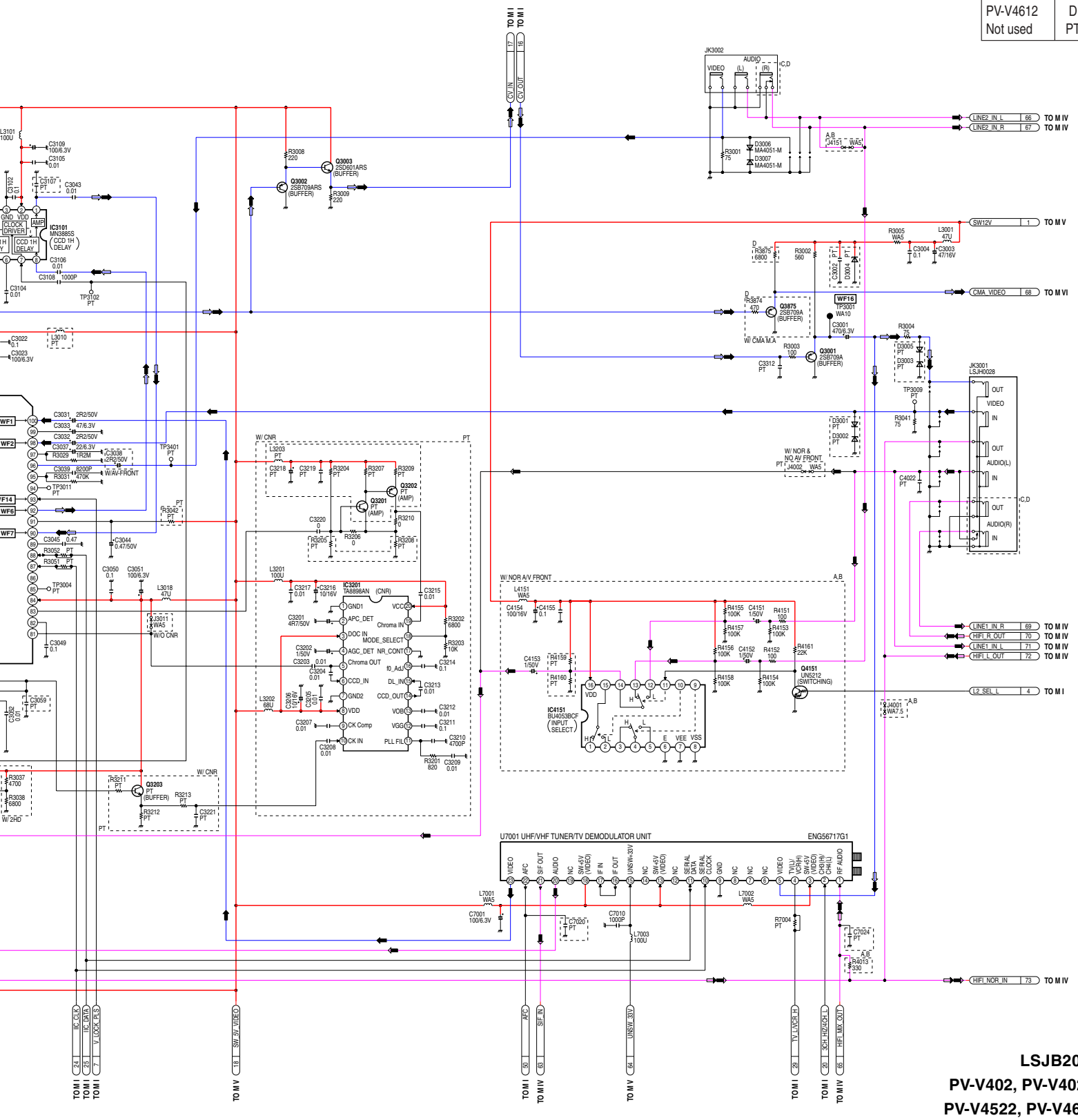


NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

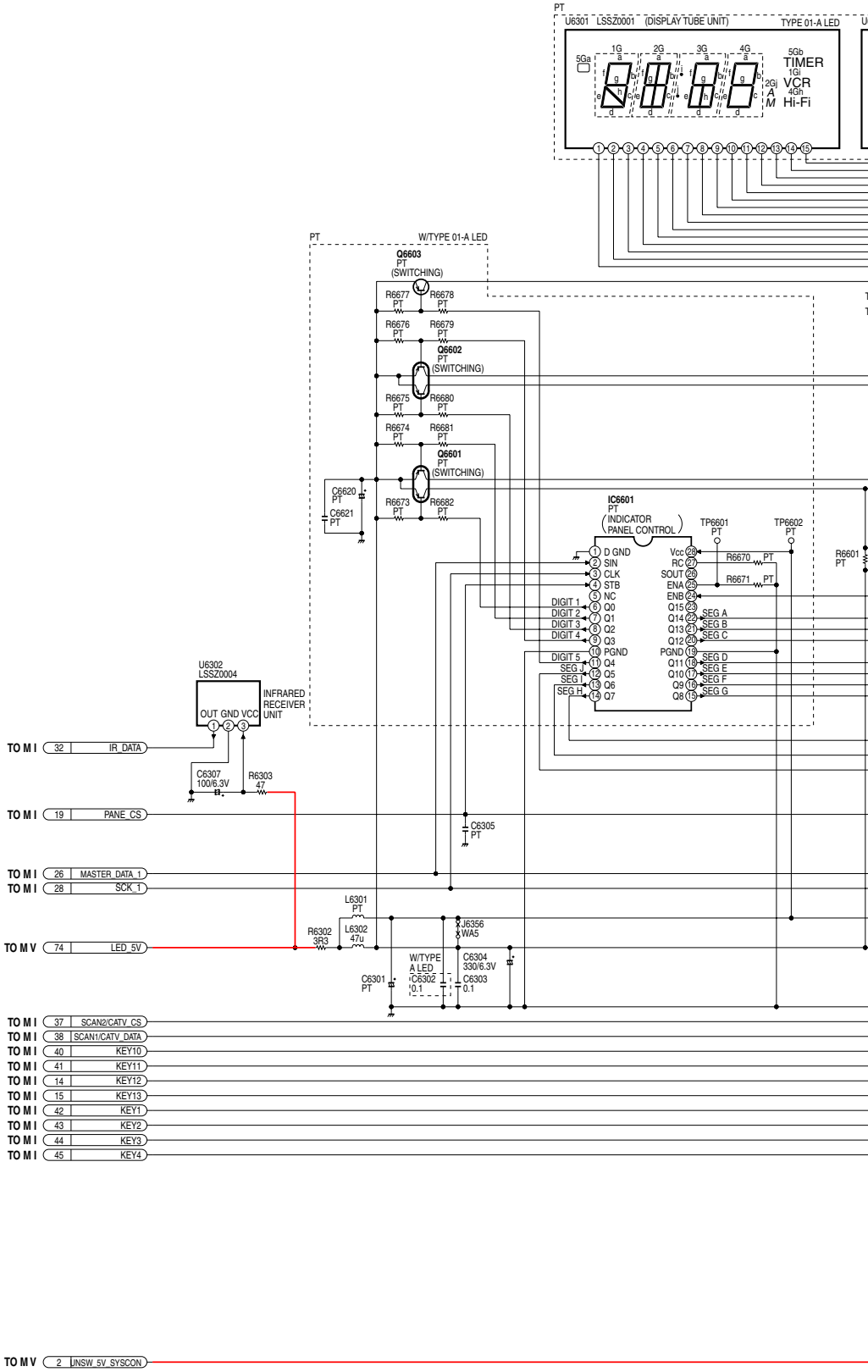
COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT



LSJB2006
PV-V402, PV-V4022,
PV-V4522, PV-V4612
MAIN II (SIGNAL PROCESS/ AUDIO) SCHEMATIC DIAGRAM

MAIN III (OPERATION) SCHEMATIC DIAGRAM

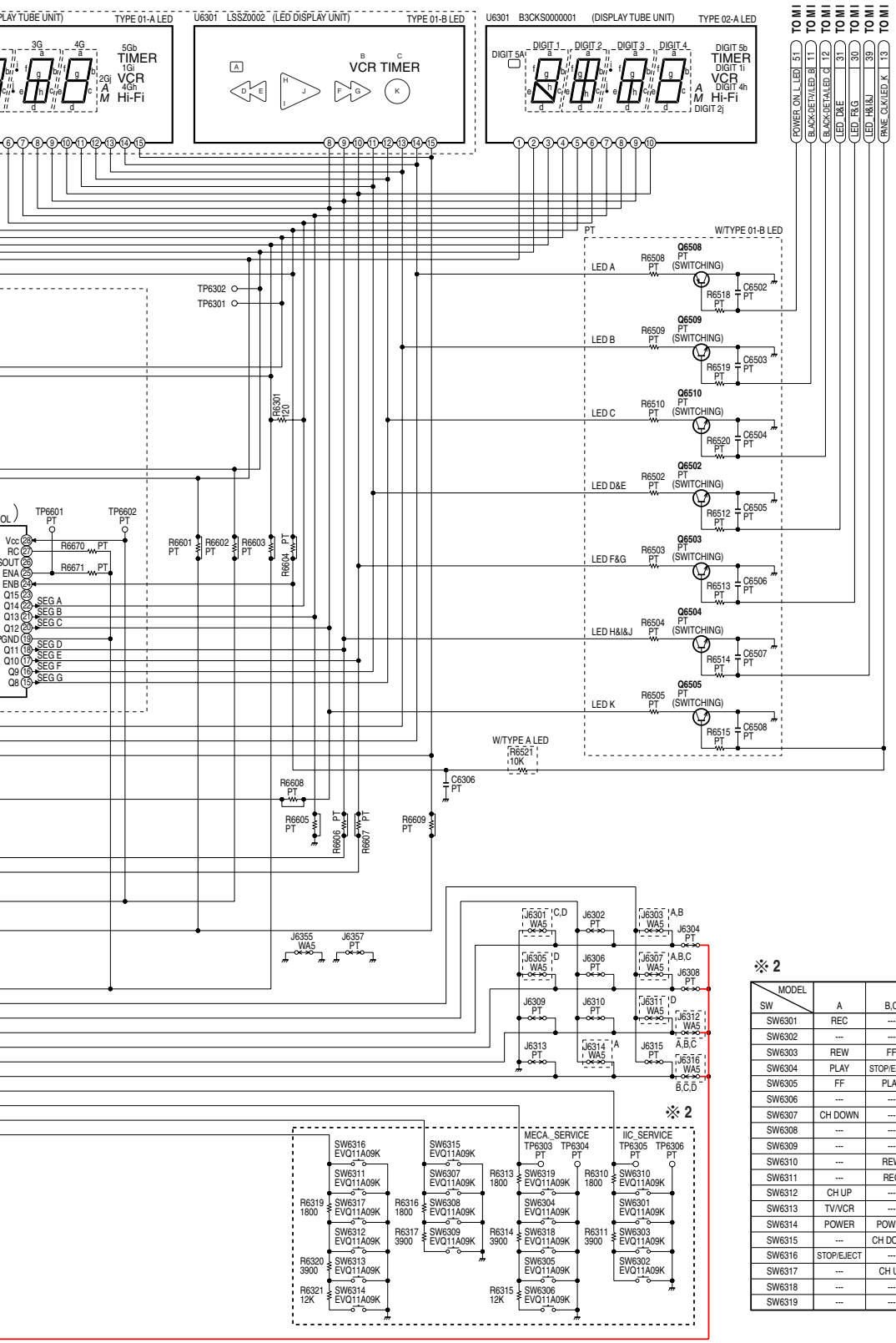


NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT

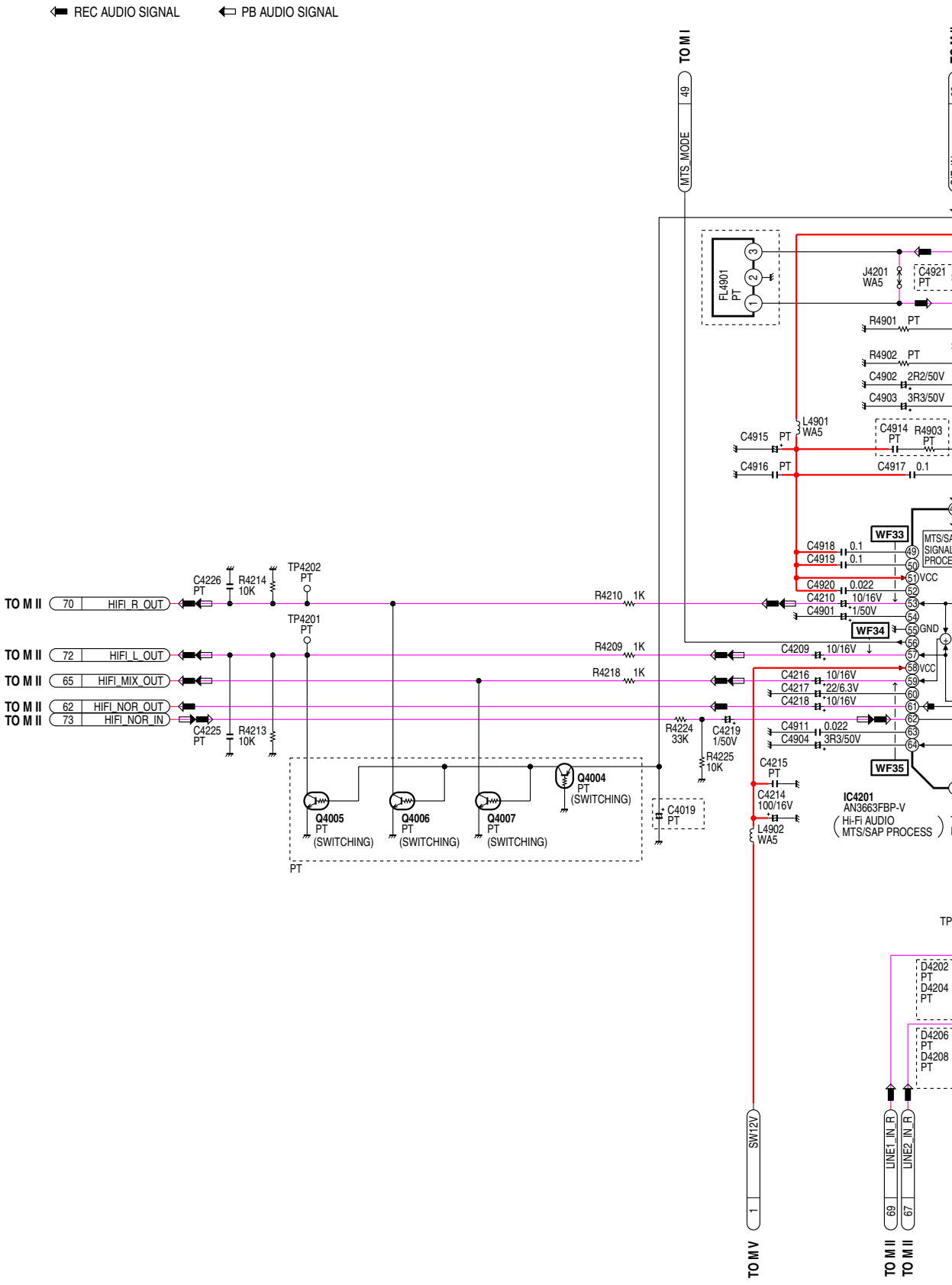


※2

SW \ MODEL	A	B,C	D
SW6301	REC	---	---
SW6302	---	---	---
SW6303	REW	FF	STOP/EJECT
SW6304	PLAY	STOP/EJECT	REW
SW6305	FF	PLAY	PLAY
SW6306	---	---	FF
SW6307	CH DOWN	---	---
SW6308	---	---	---
SW6309	---	---	---
SW6310	---	REW	---
SW6311	---	REC	REC
SW6312	CH UP	---	---
SW6313	TV/VCR	---	---
SW6314	POWER	POWER	POWER
SW6315	---	CH DOWN	CH DOWN
SW6316	STOP/EJECT	---	---
SW6317	---	CH UP	CH UP
SW6318	---	---	---
SW6319	---	---	---

LSJB2006
PV-V402, PV-V4022,
PV-V4522, PV-V4612
MAIN III (OPERATION) SCHEMATIC DIAGRAM

MAIN IV (Hi-Fi) SCHEMATIC DIAGRAM (C,D)

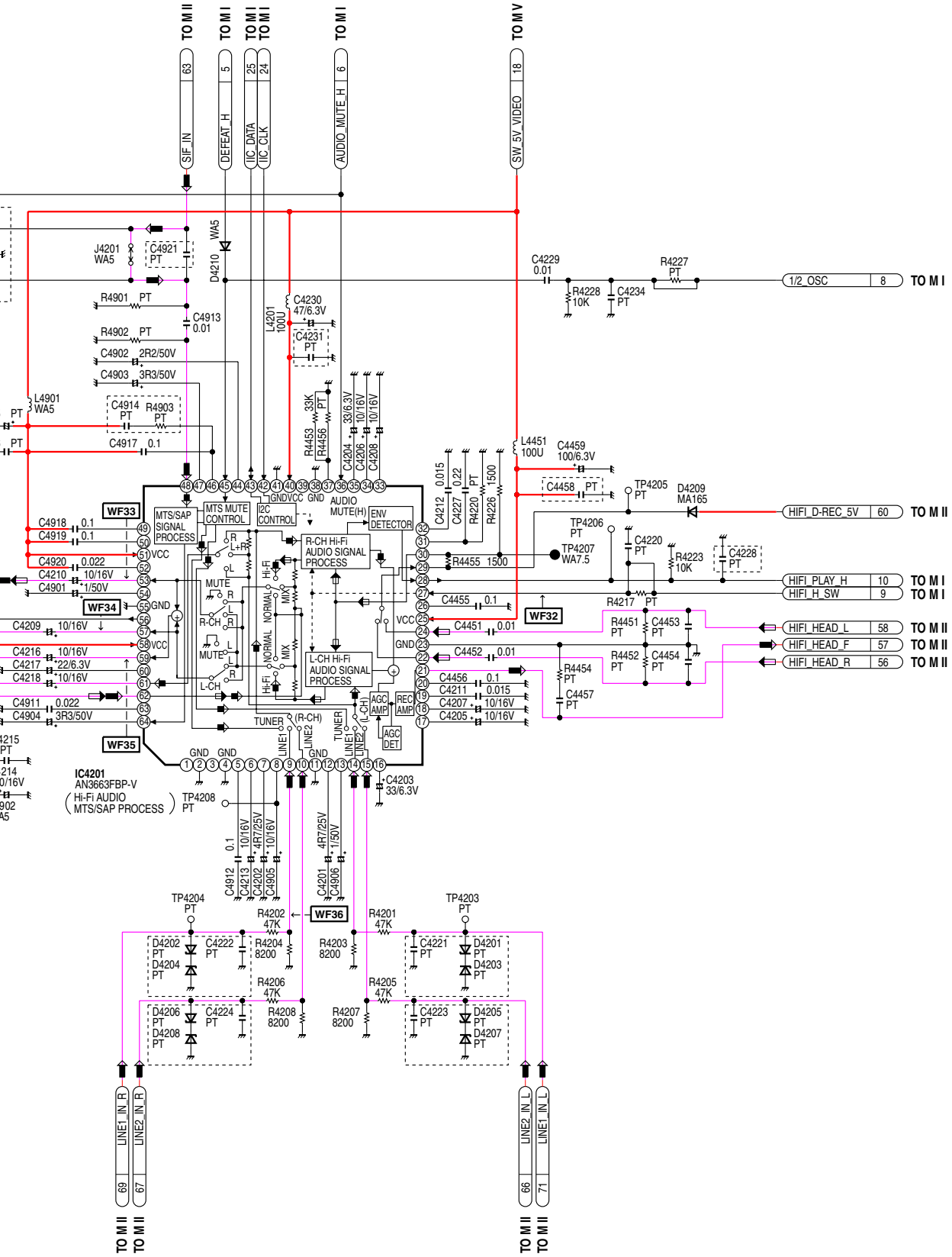


NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT

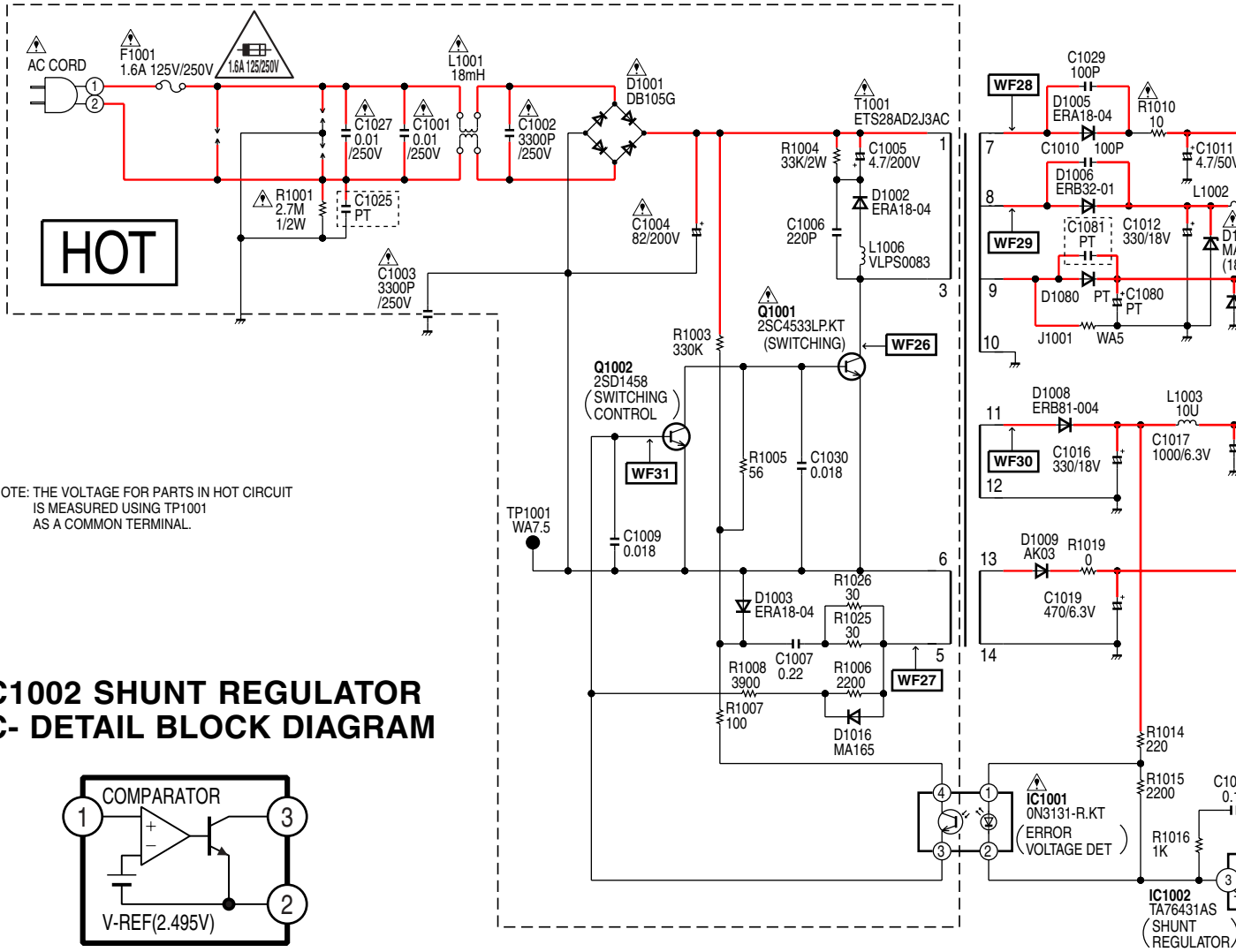


MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE 1.6A 125/250V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES
D'T INCENDIE N'I UTILISERQUE DES FUSIBLE DE MÉME
TYPE 1.6A 125/250V

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,
USE ONLY THE SPECIFIED PARTS.

HOT CIRCUIT. BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.



NOTE: THE VOLTAGE FOR PARTS IN HOT CIRCUIT
IS MEASURED USING TP1001
AS A COMMON TERMINAL.

IC1002 SHUNT REGULATOR IC- DETAIL BLOCK DIAGRAM

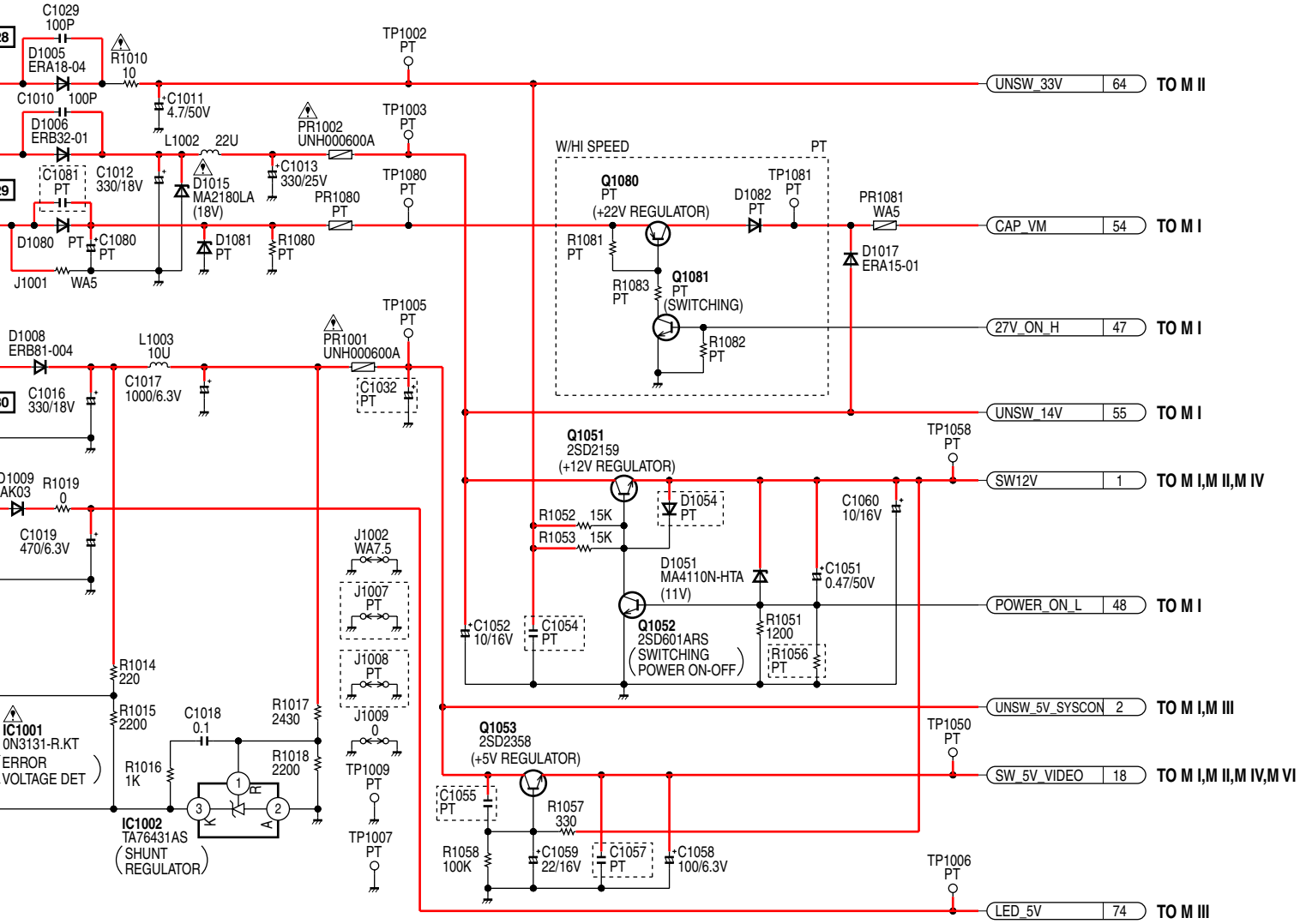
NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

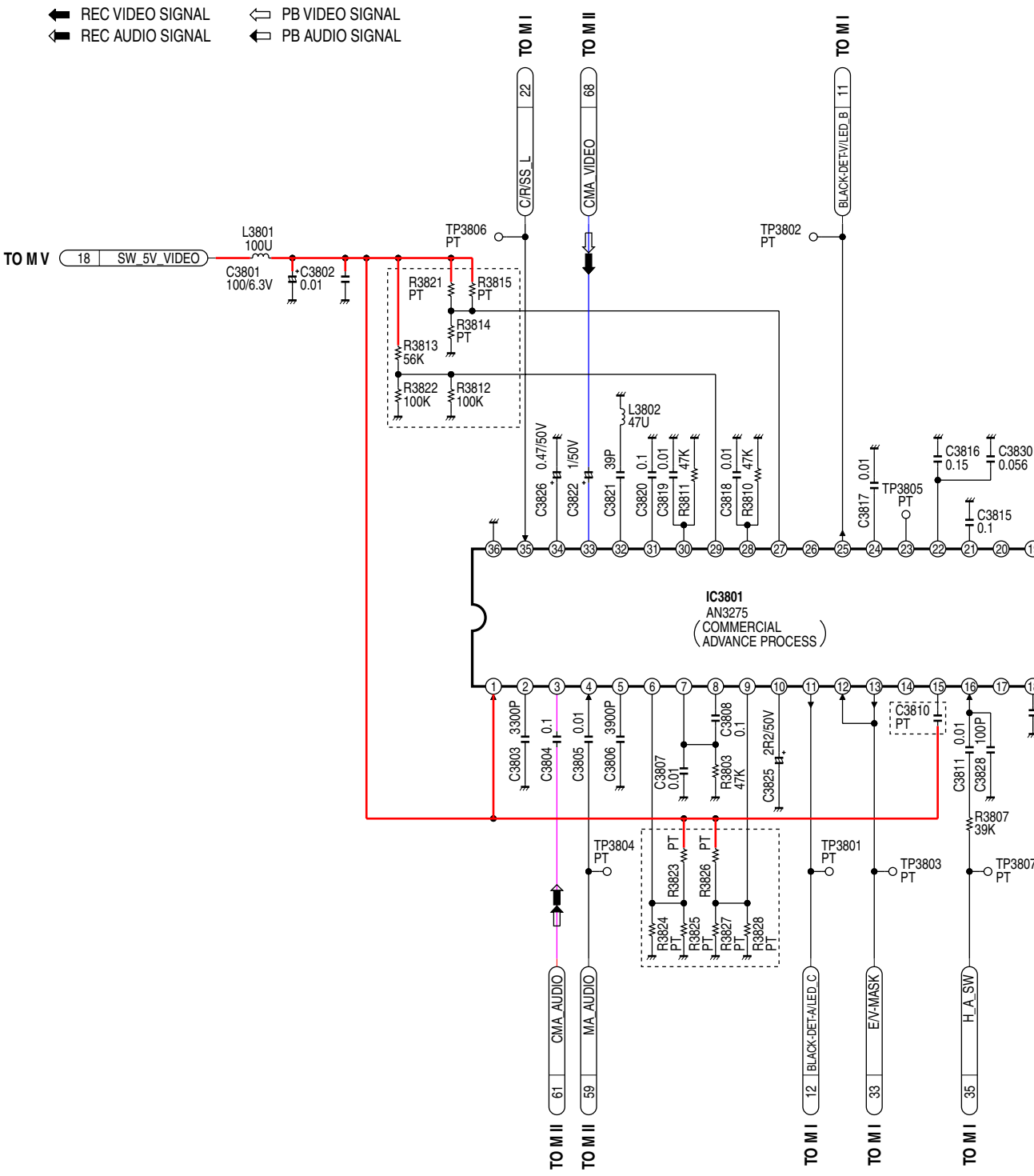
MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT

E
FETY.
,



LSJB2006
PV-V402, PV-V4022,
PV-V4522, PV-V4612
MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM

MAIN VI (ADVANCE) SCHEMATIC DIAGRAM (D)

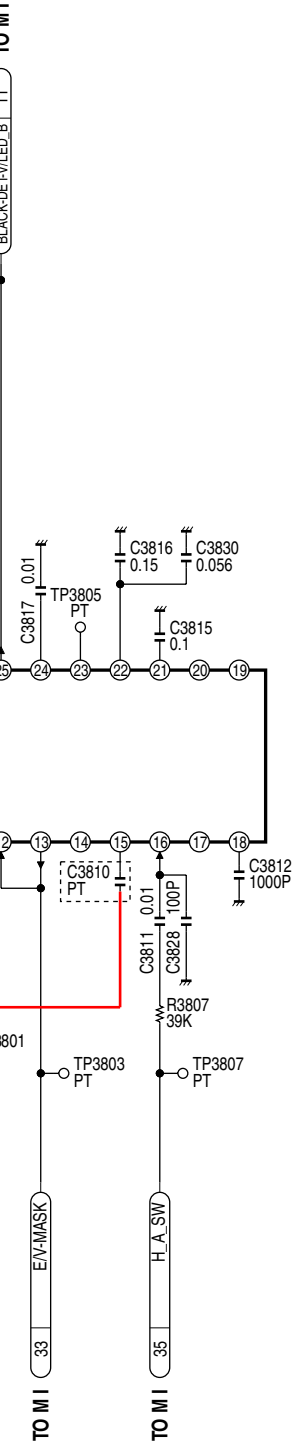


NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

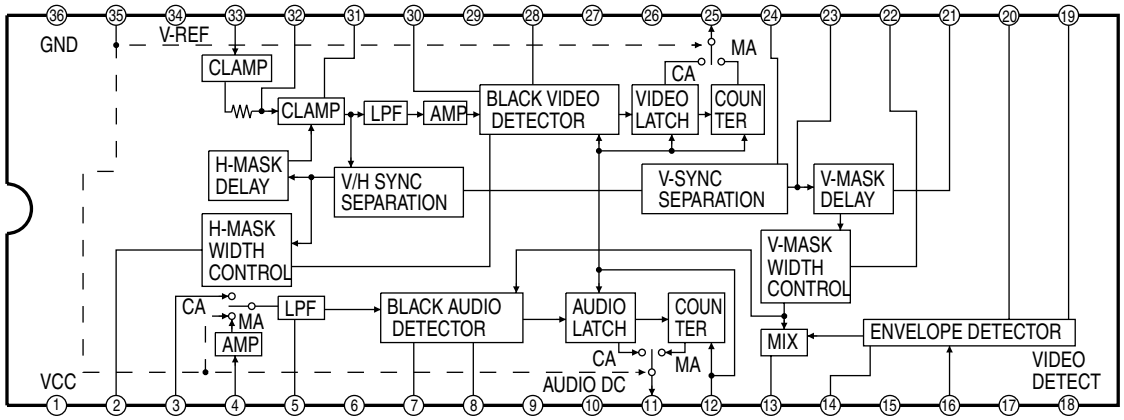
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT



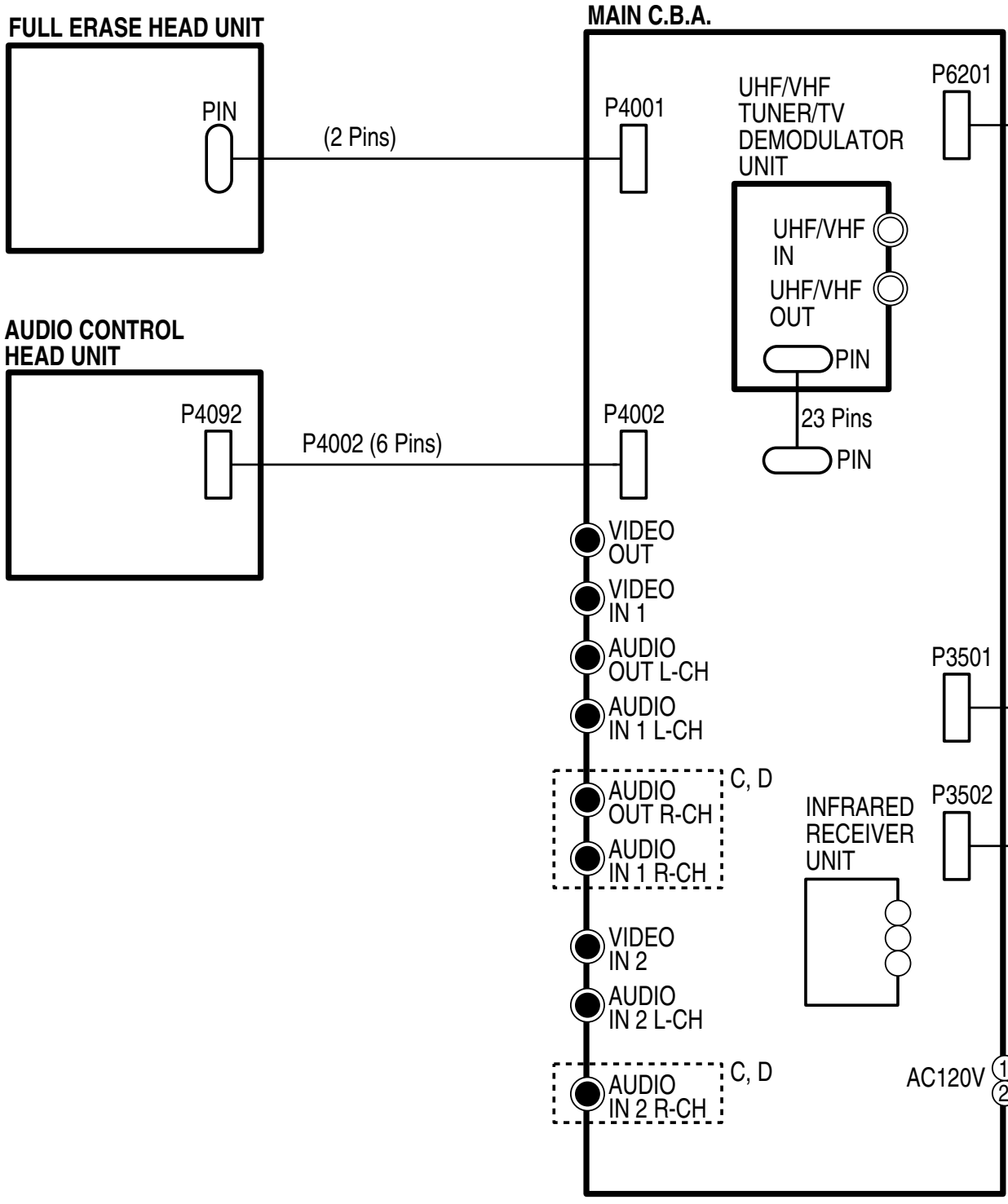
IC3801 COMMERCIAL ADVANCE PROCESS IC- DETAIL BLOCK DIAGRAM



LSJB2006
PV-V4612
MAIN VI (ADVANCE) SCHEMATIC DIAGRAM (D)

7.3. INTERCONNECTION SCHEMATIC DIAGRAM

INTERCONNECTION SCHEMATIC DIAGRAM

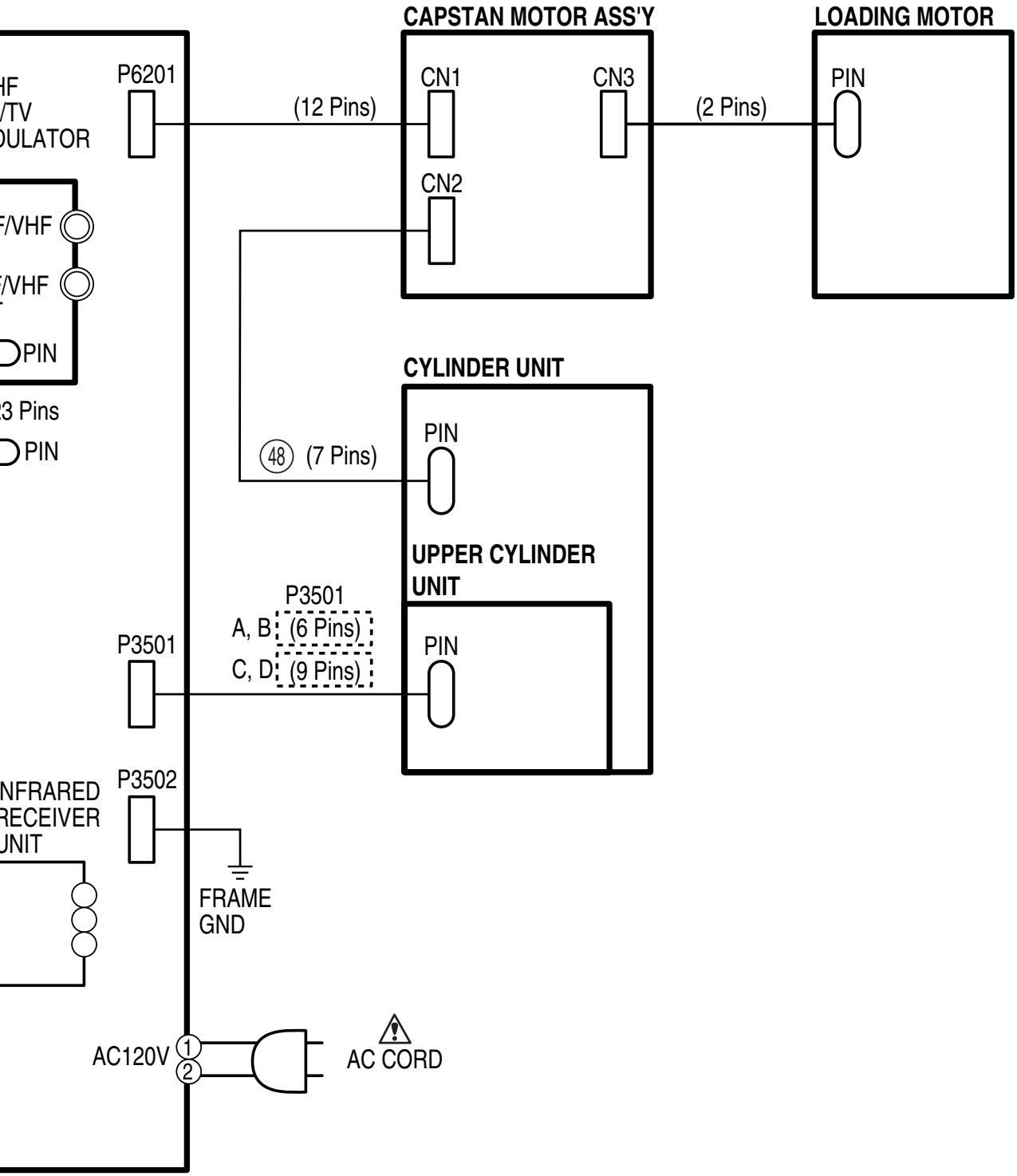


IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT



PV-V402, PV-V4022,
PV-V4522, PV-V4612
INTERCONNECTION SCHEMATIC DIAGRAM

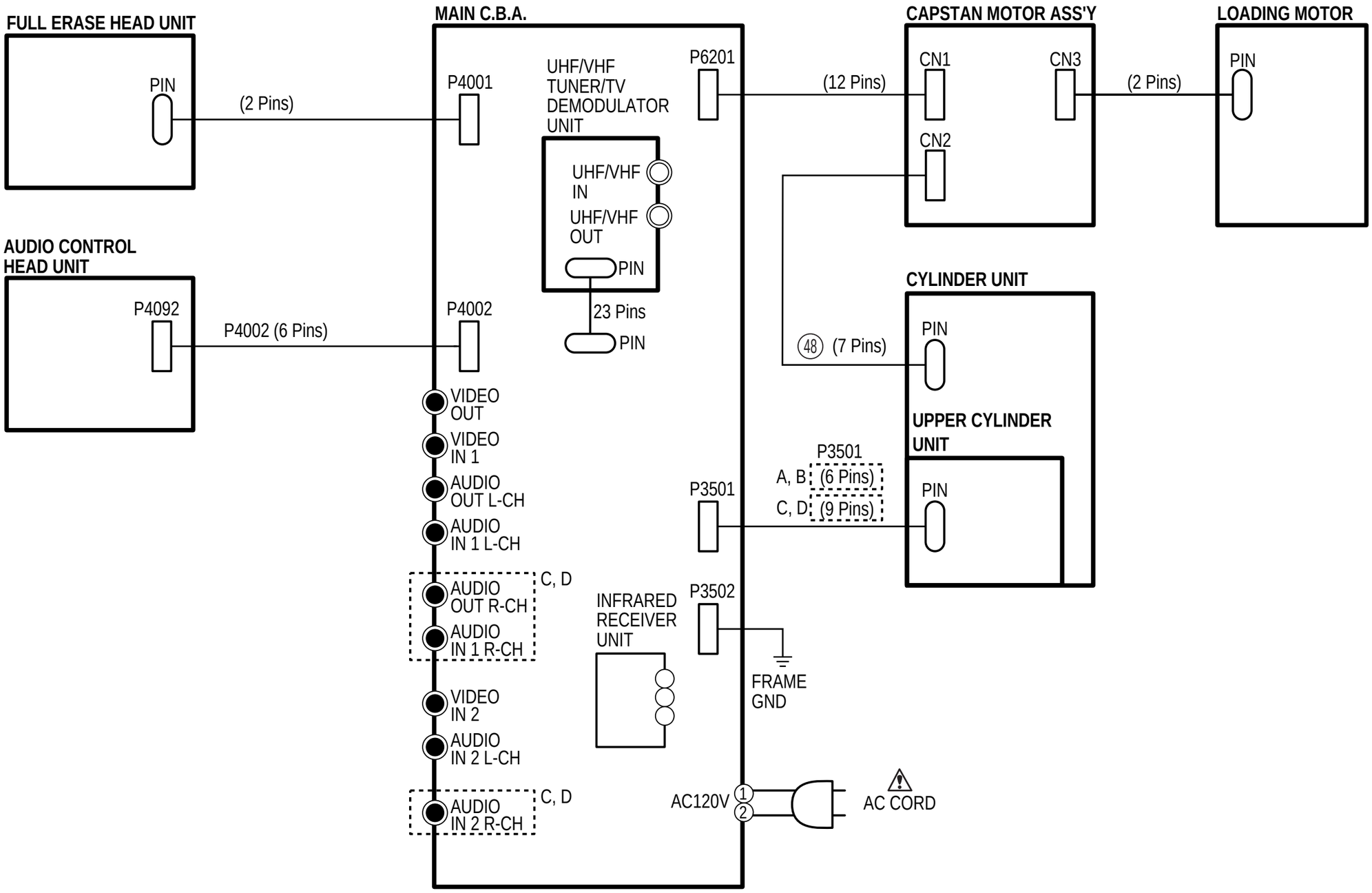
INTERCONNECTION SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT



MAIN I (SYSTEM CONTROL/ SERVO) SCHEMATIC DIAGRAM

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

※1 Microcontroller IC (IC6001) and EEP ROM IC (IC6005) replacement note for PV-V402, PV-V4022, and PV-V4522:
In early units, MN101D06FPK is used for Microcontroller IC (IC6001).
In later units, MN101D09EPA is used for Microcontroller IC (IC6001).
Please note that only MN101D09EPA is supplied as a replacement part and this can be used with both types of EEP ROM IC (IC6005).
When replacing EEP ROM IC (IC6005), be sure to confirm which type of Microcontroller IC (IC6001) is used on the unit you are servicing and install the proper part for EEP ROM IC (IC6005).

	Microcontroller IC (IC6001)	EEPROM IC (IC6005)
Early Unit	MN101D06FPK	LSEQ0642
Later Unit	MN101D09EPA	KS24C011CS or AT24C01A10SI or C0ZBZ0000015 or C3EBCC000038 or KS24C011IS or M24C01-MN6

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT

MODE SELECT SWITCH

PIN NO. OF IC6001 / MODE	A (97)	B (96)	C (95)
FF/REW	H	H	L
BRAKE	L	H	H
PLAY/CUE/SLOW/STILL	L	H	L
REVIEW	H	L	L
STANDBY/STOP	H	L	H
CASSETTE DOWN	L	L	H
EJECT	L	L	L

A
KEY VOLTAGE CHART (SW6301, 6303, 6304, 6305, 6307, 6312, 6313, 6314, 6316)

TERMINAL VOLTAGE	0V～0.6V	0.7V～1.9V	2.0V～3.1V	3.2V～4.4V
KEY DATA1 (PIN 89)	-----	REC	REW	-----
KEY DATA2 (PIN 88)	-----	PLAY	FF	-----
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	STOP/EJECT	CH UP	TV/VCR	POWER

B, C
KEY VOLTAGE CHART (SW6303, 6304, 6305, 6310, 6311, 6314, 6315, 6317)

TERMINAL VOLTAGE	0V～0.6V	0.7V～1.9V	2.0V～3.1V	3.2V～4.4V
KEY DATA1 (PIN 89)	-----	REW	FF	-----
KEY DATA2 (PIN 88)	-----	STOP/EJECT	PLAY	-----
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	REC	CH UP	-----	POWER

D
KEY VOLTAGE CHART (SW6303, 6304, 6305, 6306, 6311, 6314, 6315, 6317)

TERMINAL VOLTAGE	0V～0.6V	0.7V～1.9V	2.0V～3.1V	3.2V～4.4V
KEY DATA1 (PIN 89)	-----	-----	STOP/EJECT	-----
KEY DATA2 (PIN 88)	-----	REW	PLAY	FF
KEY DATA3 (PIN 87)	CH DOWN	-----	-----	-----
KEY DATA4 (PIN 86)	REC	CH UP	-----	POWER

REC VIDEO SIGNAL ⇦ PB VIDEO SIGNAL ⇦ CAPSTAN SERVO ⇦ CYLINDER SERVO

TO M V 1 SW12V
TO M V 2 UNSW_5V_SYSCON
TO M II 3 D_REC_12V
TO M II 4 L2_SEL_L
TO M IV 5 DEFEAT_H
TO M II,M IV 6 AUDIO_MUTE_H
TO M II 7 V_LOCK_PLS
TO M IV 8 1/2_OSC
TO M IV 9 HIFI_H_SW
TO M IV 10 HIFI_PLAY_H
TO M III,M VI 11 BLACK-DET-V/LED_B
TO M III,M VI 12 BLACK-DET-A/LED_C
TO M III 13 PANE_CLK/LED_K
TO M III 14 KEY12
TO M III 15 KEY13
TO M II 16 CV_OUT
TO M II 17 CV_IN
TO M V 18 SW_5V_VIDEO
TO M III 19 PANE_CS
TO M II 20 3CH_HIZ/4CH_L
TO M VI 22 CR/ISS_L

※1 IC6005 KS24C011CS :A,B,C AT24C01A10SI :D (MEMORY)
※1 IC6001 MN101D06EPA :A,B,C MN101D06FPL :D (SYSTEM CONTROL/SERVO/TIMER MICROCONTROLLER)

LINK TO SERVO BLOCK DIAGRAM
LINK TO I/O CHART

IC6004 PST3147NR (IC6001 RESET)
Q6002 2SB709ARS (SWITCHING REC-ON)
Q6003 2SD1819ARS (SWITCHING DELAY REC ON-ON)
Q6005 2SB709ARS (SWITCHING POWER ON-ON)
Q6006 2SD1819ARS (SWITCHING POWER ON-ON)
Q6001 2SD1819ARS (IC6001 RESET)
Q6010 VEKS5707 (TAKEUP PHOTO TR)
Q6009 VEKS5707 (SUPPLY PHOTO TR)
D6001 VEKS5708 (SENSOR LED)
IC6002 RPI-303 (TAKEUP REEL SENSOR)
IC6003 RPI-303 (SUPPLY REEL SENSOR)
SW6001 LSSH0002 (SAFETY TAB SW)
SW6002 LSSS0012 (MODE SELECT SWITCH)
X6001 VSXS0232-TB 14MHz

WF18 WF25 WF21 WF23 WF22 WF24 WF19 WF20

TO M II 1 H_SW
TO M II 2 IIC_CLK
TO M II,M IV 3 IIC_DATA
TO M III 4 MASTER_DATA_1
TO M III 5 SCK_1
TO M II 6 TV_LVCR_H
TO M III 7 LED_F&G
TO M III 8 LED_D&E
TO M VI 9 E/V-MASK
TO M III 10 IR_DATA
TO M II 11 ENV_DET
TO M II,M VI 12 H_A_SW
TO M II 13 ROTA_SW
TO M III 14 SCAN2/CATV_CS
TO M III 15 SCAN1/CATV_DATA
TO M III 16 LED_H&I&J
TO M III 17 KEY10
TO M III 18 KEY11
TO M III 19 KEY1
TO M III 20 KEY2
TO M III 21 KEY3
TO M III 22 KEY4
TO M II 23 AT_ENV
TO M V 24 27V_ON_H
TO M V 25 POWER_ON_L
TO M IV 26 MTS_MODE
TO M II 27 AFC
TO M III 28 POWER_ON_L_LED
TO M II 29 CTL-
TO M II 30 CTL+
TO M V 31 CAP_VM
TO M V 32 UNSW_14V

P6201 (TO CAPSTAN MOTOR ASS'Y CN1)
1 CAPSTAN MOTOR REVERSE(H)/FORWARD(L)
2 MOTOR GND
3 CAPSTAN FG OUTPUT
4 VCC(22V) FOR CAPSTAN MOTOR
5 CURRENT LIMIT FOR CAPSTAN MOTOR
6 VCC(5V)
7 CYLINDER PG/FG OUTPUT
8 CYLINDER SPEED CONTROL
9 CAPSTAN MOTOR SPEED CONTROL
10 VCC(14V) FOR CYLINDER & LODING MOTOR
11 SIGNAL GND
12 LODING MOTOR CONTROL REVERSE(L)/STOP(M)/FORWARD(H)

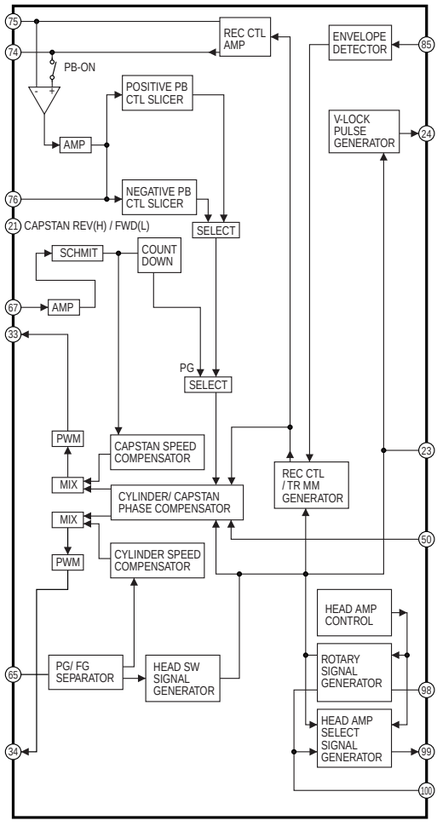
LSJB2006
PV-V402, PV-V4022,
PV-V4522, PV-V4612
MAIN I (SYSTEM CONTROL /SERVO) SCHEMATIC DIAGRAM

I/O CHART OF IC6001

Pin No.	I/O	Signal Name	Description
1	I	POWER_DOWN_L	POWER DOWN(L)
2	O	E/V-MASK	REW LED ON(H)/E/V-MASK
3	I	T-REEL	TAKEUP REEL PULSE
4	I	S-REEL	SUPPLY REEL PULSE
5	I	IR-DATA	IR-DATA
6	-	NC	(Not used)
7	-	NC	(Not used)
8	-	NC	(Not used)
9	-	NC	(Not used)
10	-	NC	(Not used)
11	O	SCK_1	SERIAL CLOCK 1
12	O	SLAVE_DATA_1	SERIAL DATA 1
13	O	MASTER_DATA_1	SERIAL DATA 0
14	O	LD_CTL	LOADING MOTOR CONTROL REVERSE(L)/STOP(M)/FORWARD(H)
15	O	LED_F&G	FF LED ON(H)
16	O	TV_L/VCR_H	TV(L)/VCR(H)
17	I/O	IIC_DATA	I2C SERIAL DATA
18	O	IIC_CLK	I2C SERIAL CLOCK
19	O	INPUT2	INPUT SELECT 2
20	O	DEFEAT_H	AUDIO DEFEAT(H)
21	O	CAP_R/F	CAPSTAN MOTOR REVERSE(H)/FORWARD(L)
22	O	A-MUTE_H	AUDIO MUTE(H)
23	O	HSW	HEAD SW
24	O	V-LOCKPLS	V-LOCK PULSE
25	I	RST	RESET
26	O	1/4_OSC	3.58MHz
27	O	HIFI-HSW	Hi-Fi HEAD SW
28	O	V-D-REC_H	VIDEO DELAY REC(H)
29	I	HIFI-PB_H	Hi-Fi PB(H)
30	I	S-TAB	SAFETY TAB BROKEN(H)
31	I/O	BLACK-DET-V/LED_B	VIDEO BLACK DETECT(L)/VCR LED ON(H)
32	I/O	BLACK-DET-A/LED_C	AUDIO BLACK DETECT(L)/TIMER LED ON(H)
33	O	PWM1(CAP)	CAP ERROR
34	O	PWM0(CYL)	CYL ERROR
35	O	PANE_CLK/LED_K	PANEL CLOCK/REC LED ON(H)
36	I	DVDD	VDD
37	O	OSC_OUT	OSC 2
38	I	OSC_IN	OSC 1
39	-	DVSS	GND
40	I	KEY12	KEY DATA 12
41	I	KEY13	KEY DATA 13
42	-	SXI	SXI
43	-	NC	(Not used)
44	-	NC	(Not used)
45	-	NC	(Not used)
46	-	NC	(Not used)
47	O	CV_OUT	VIDEO
48	-	OSD_VSS	GND
49	I	CV_IN	VIDEO
50	I	CV_IN2	V-SYNC

Pin No.	I/O	Signal Name	Description
51	I	OSD_VDD	VDD
52	O	AFCC	AFC
53	I	AFCLPF	AFC
54	O	PANE_CS	PANEL CS(L)
55	O	3CH_HIZ/4CH_L	CH3(H)/CH4(L)
56	-	NC	(Not used)
57	-	NC	(Not used)
58	-	NC	(Not used)
59	-	NC	(Not used)
60	-	NC	(Not used)
61	-	NC	(Not used)
62	-	NC	(Not used)
63	-	NC	(Not used)
64	-	NC	(Not used)
65	I	PFG	CYL PG/FG
66	O	C/R/SS_L	CUE/REV/SS(L)
67	I	FGF	CAP FG
68	-	AFG	CAP FG
69	O	VRO	V-REF 1
70	-	VRI	V-REF 2
71	-	AVSS	VSS
72	-	CTLA	CTL AMP
73	I	AVDD	VDD
74	I/O	RCTLP	CTL PULSE(+)
75	-	RCTLN	CTL PULSE(-)
76	-	CO	PB CONTROL PULSE
77	-	NC	(Not used)
78	-	NC	(Not used)
79	I	T-PHOTO_L	TAKEUP PHOTO TR(L)
80	I	S-PHOTO_L	SUPPLY PHOTO TR(L)
81	I	DTS-AFC	AFC
82	I	MTS_MODE	MTS MODE
83	O	POWER-ON_L	POWER ON(L)
84	O	27V_ON_H	SW+27V ON(H)
85	I	AT_ENV	ENV-VOLTAGE
86	I	KEY4	KEY DATA 4
87	I	KEY3	KEY DATA 3
88	I	KEY2	KEY DATA 2
89	I	KEY1	KEY DATA 1
90	I	KEY11	KEY DATA 11
91	I	KEY10	KEY DATA 10
92	O	LED_H&I&J	PLAY LED ON(H)
93	O	SCAN1/CATV_DATA	SCAN 1
94	O	SCAN2/CATV_CS	SCAN 2
95	I	POS.3	MODE SW POSITION C
96	I	POS.2	MODE SW POSITION B
97	I	POS.1	MODE SW POSITION A
98	O	ROT	ROTARY SW
99	O	HAMP	HEAD AMP SW
100	I	DENV	ENVELOPE DET

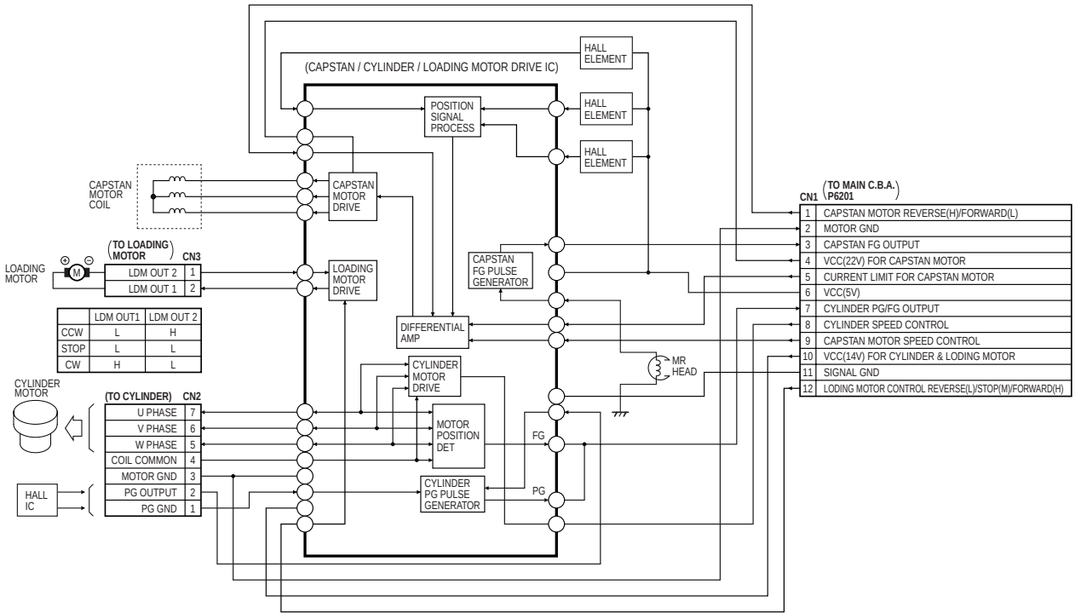
IC6001 SERVO BLOCK DIAGRAM



CAPSTAN MOTOR ASS'Y

NOTE:
CAPSTAN MOTOR ASS'Y (REF. NO. 46) IS SUPPLIED AS A UNIT ONLY.
HOWEVER, THE FLAT FLEXIBLE CABLE (REF. NO. 48) IS AVAILABLE SEPARATELY AS A REPLACEMENT PART.

"FOR REFERENCE ONLY"



MAIN II (SIGNAL PROCESS/AUDIO) SCHEMATIC DIAGRAM

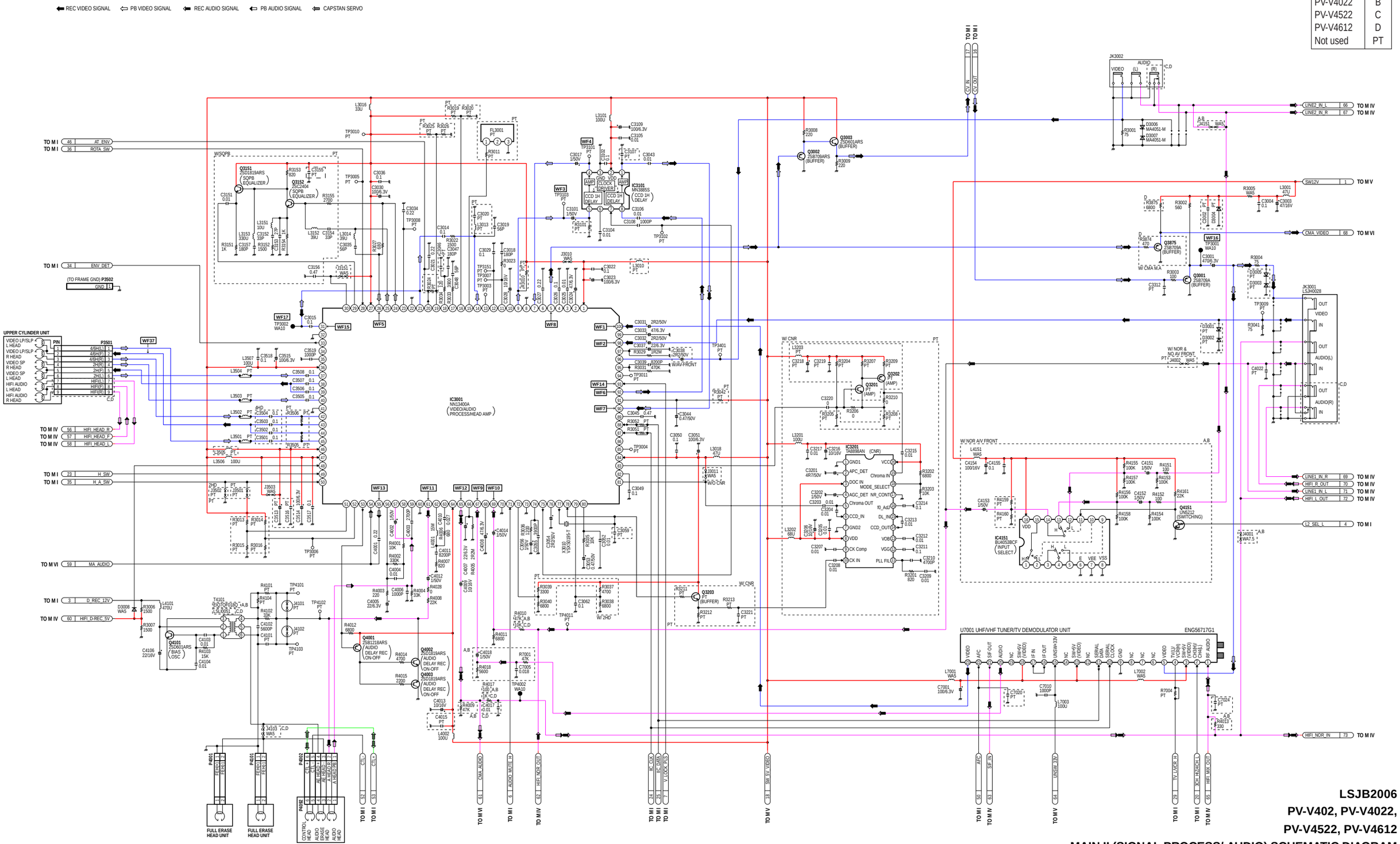
NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

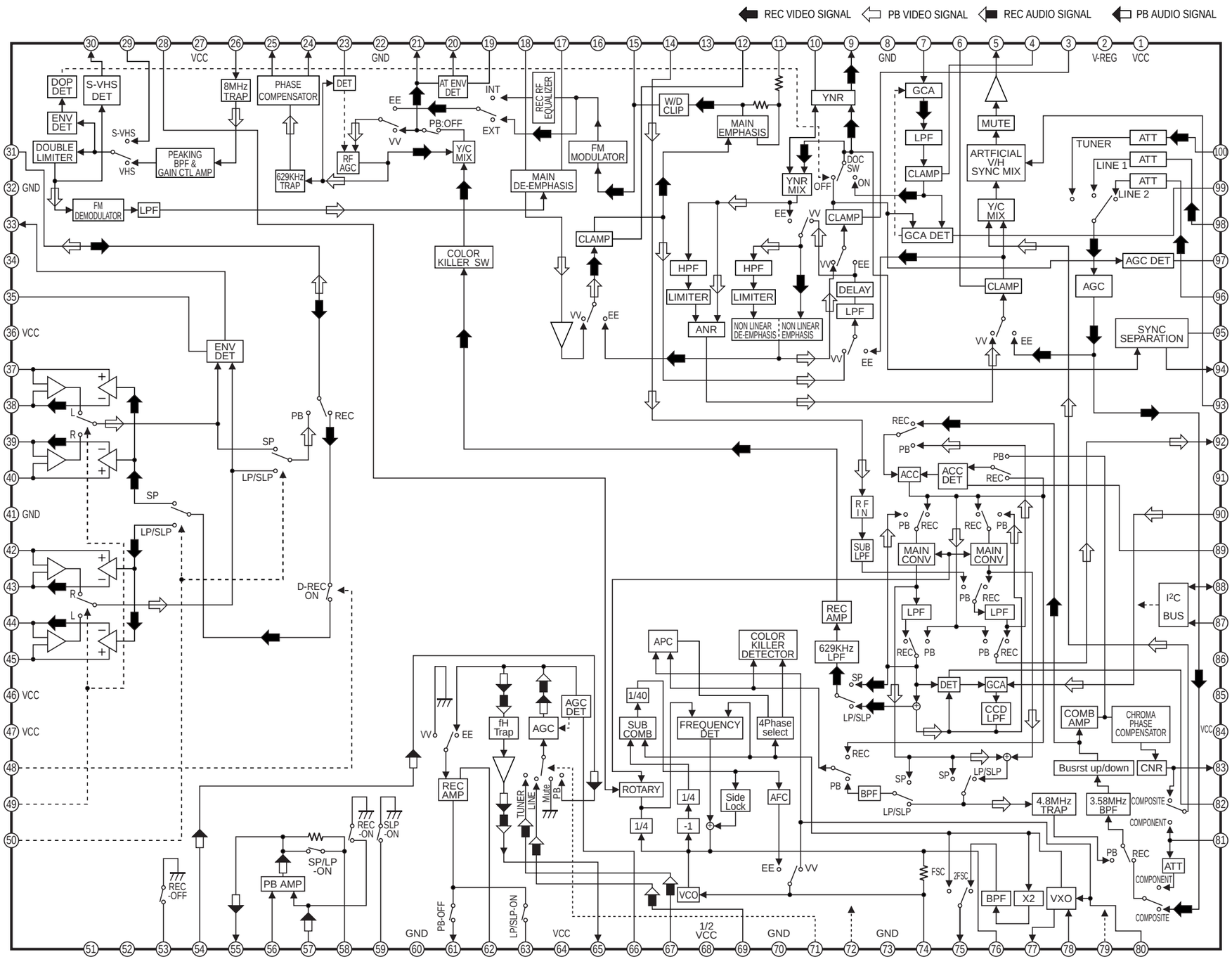
MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT

REC VIDEO SIGNAL ⇦ PB VIDEO SIGNAL ⇦ REC AUDIO SIGNAL ⇦ PB AUDIO SIGNAL ⇦ CAPSTAN SERVO



LSJB2006
PV-V402, PV-V4022,
PV-V4522, PV-V4612
MAIN II (SIGNAL PROCESS/ AUDIO) SCHEMATIC DIAGRAM

IC3001 VIDEO/AUDIO SIGNAL PROCESS / HEAD AMP IC- DETAIL BLOCK DIAGRAM



PV-V402, PV-V4022,
PV-V4522, PV-V4612
IC3001 DETAIL BLOCK DIAGRAM

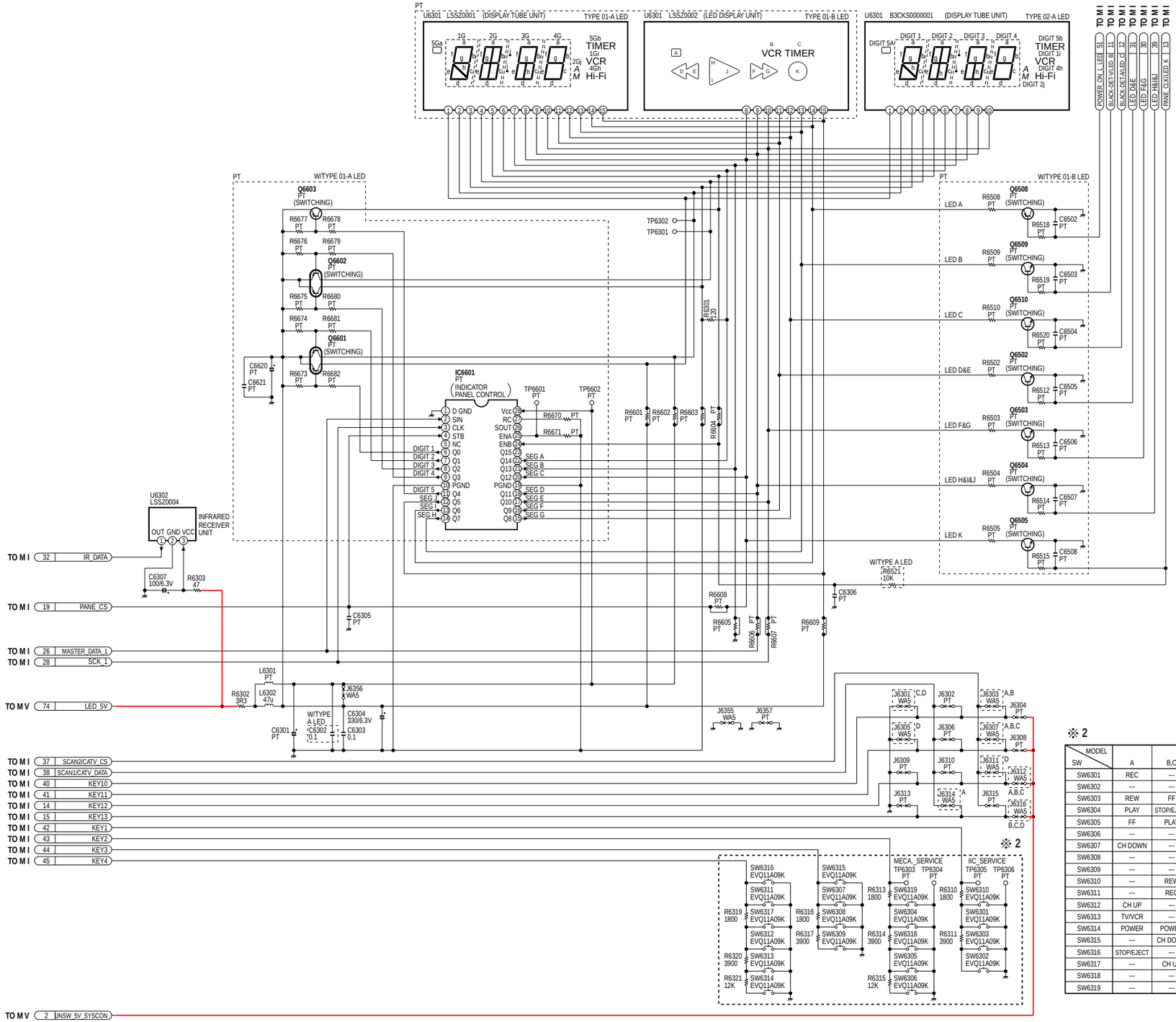
MAIN III (OPERATION) SCHEMATIC DIAGRAM

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT


U6301 LSSZ0001 (DISPLAY TUBE UNIT) TYPE 01-A LED
U6301 LSSZ0002 (LED DISPLAY UNIT) TYPE 01-B LED
U6301 B3CKS0000001 (DISPLAY TUBE UNIT) TYPE 02-A LED
VCR TIMER
TIMER
VCR
Hi-Fi
W/TYPE 01-A LED
W/TYPE 01-B LED
IC6601
INDICATOR PANEL CONTROL
U6302 LSSZ0004
INFRARED RECEIVER UNIT
W/TYPE A LED
W/TYPE A,B LED
TO M I 32 IR_DATA
TO M I 19 PANE_CS
TO M I 26 MASTER_DATA_1
TO M I 28 SCK_1
TO M V 74 LED_5V
TO M I 37 SCAN2/CATV_CS
TO M I 38 SCAN1/CATV_DATA
TO M I 40 KEY10
TO M I 41 KEY11
TO M I 14 KEY12
TO M I 15 KEY13
TO M I 42 KEY1
TO M I 43 KEY2
TO M I 44 KEY3
TO M I 45 KEY4
TO M V 2 UNSW_5V_SYSCON
TO M I 51 POWER_ON_L_LED
TO M I 11 BLACK_DET-VI_LED_B
TO M I 12 BLACK_DET-AI_LED_C
TO M I 31 LED_D&E
TO M I 30 LED_F&G
TO M I 39 LED_H&I&J
TO M I 13 PANE_CLK-LED_K
※2
MECA_SERVICE
IIC_SERVICE

※2

SW \ MODEL	A	B,C	D
SW6301	REC	---	---
SW6302	---	---	---
SW6303	REW	FF	STOP/EJECT
SW6304	PLAY	STOP/EJECT	REW
SW6305	FF	PLAY	PLAY
SW6306	---	---	FF
SW6307	CH DOWN	---	---
SW6308	---	---	---
SW6309	---	---	---
SW6310	---	REW	---
SW6311	---	REC	REC
SW6312	CH UP	---	---
SW6313	TV/VCR	---	---
SW6314	POWER	POWER	POWER
SW6315	---	CH DOWN	CH DOWN
SW6316	STOP/EJECT	---	---
SW6317	---	CH UP	CH UP
SW6318	---	---	---
SW6319	---	---	---

LSJB2006
PV-V402, PV-V4022,
PV-V4522, PV-V4612
MAIN III (OPERATION) SCHEMATIC DIAGRAM

MAIN IV (Hi-Fi) SCHEMATIC DIAGRAM (C,D)

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

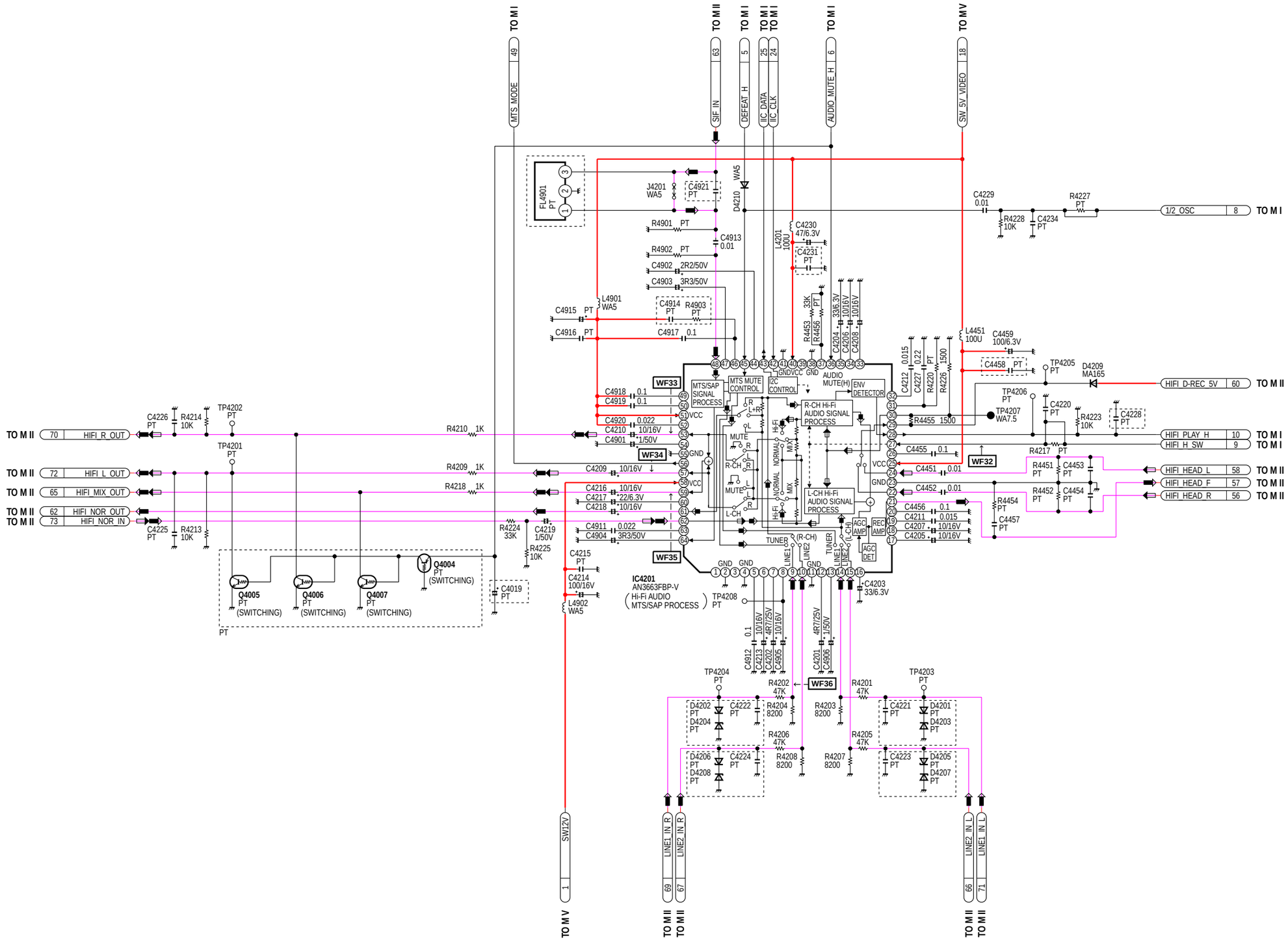
NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT

REC AUDIO SIGNAL

PB AUDIO SIGNAL



LSJB2006

PV-V4522, PV-V4612

MAIN IV (Hi-fi) SCHEMATIC DIAGRAM (C,D)

MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

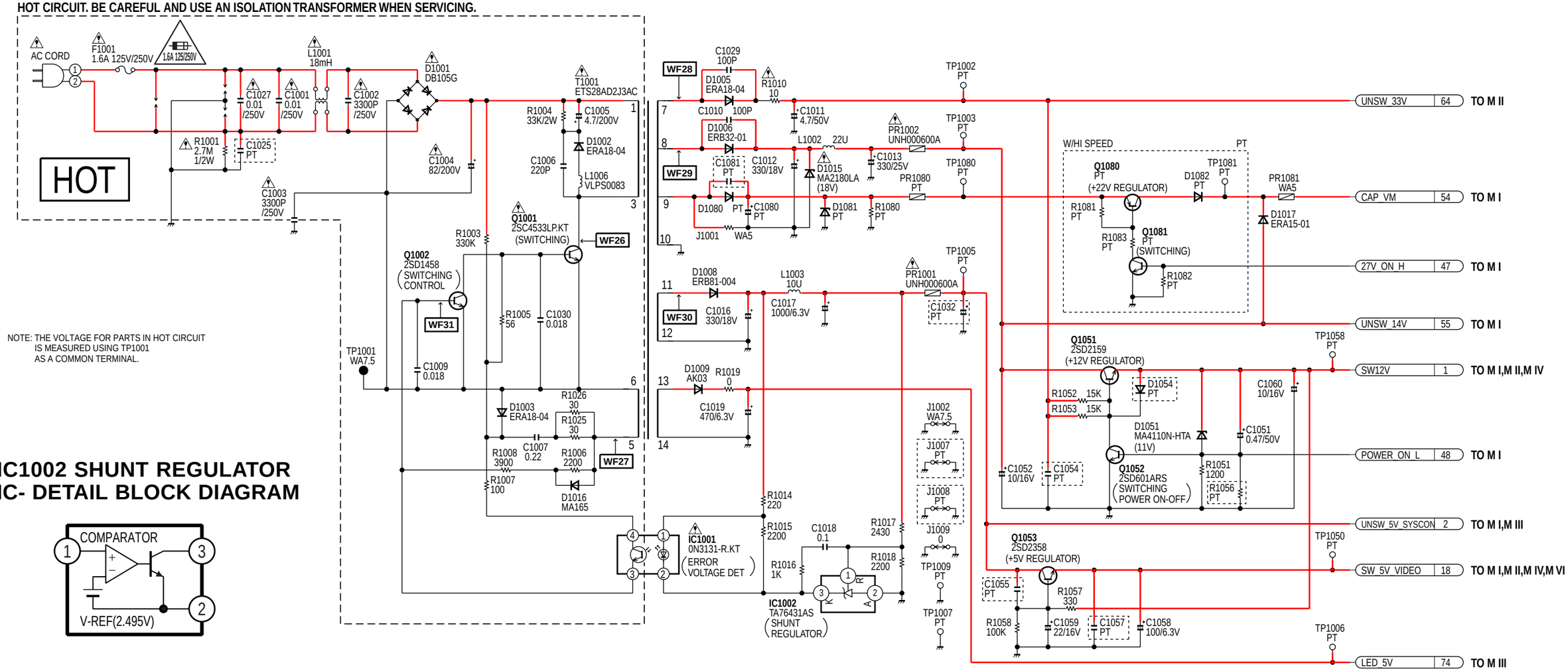
COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE 1.6A 125/250V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'T INCENDIE N'I UTILISERQUE DES FUSIBLE DE MÉME TYPE 1.6A 125/250V

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

HOT CIRCUIT. BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.



NOTE: THE VOLTAGE FOR PARTS IN HOT CIRCUIT IS MEASURED USING TP1001 AS A COMMON TERMINAL.

IC1002 SHUNT REGULATOR IC- DETAIL BLOCK DIAGRAM

LSJB2006
PV-V402, PV-V4022,
PV-V4522, PV-V4612
MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM

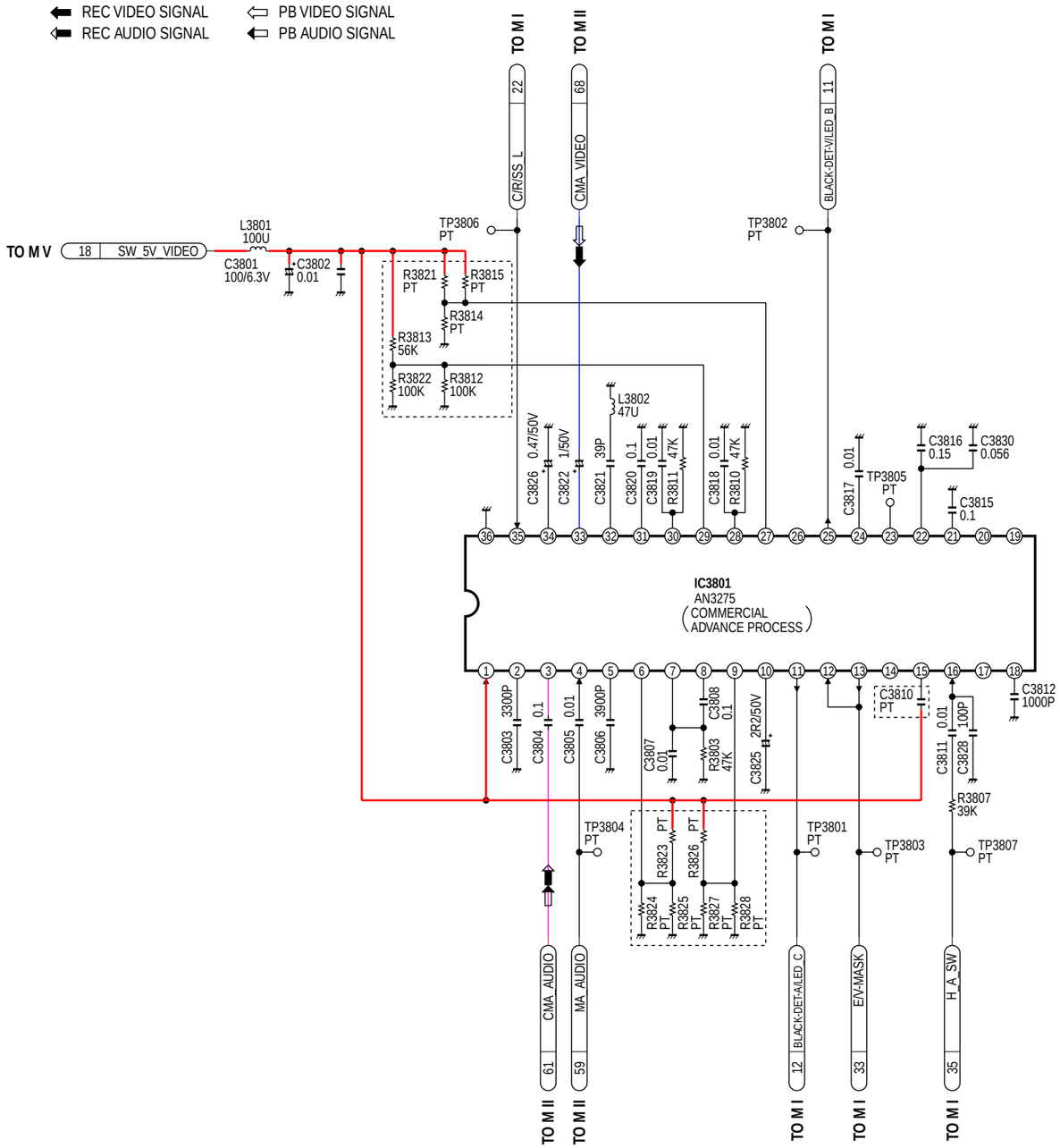
MAIN VI (ADVANCE) SCHEMATIC DIAGRAM (D)

NOTE: For placing a purchase order of the parts, be sure to use the part number listed in the parts list. Do not use the part number on this diagram.

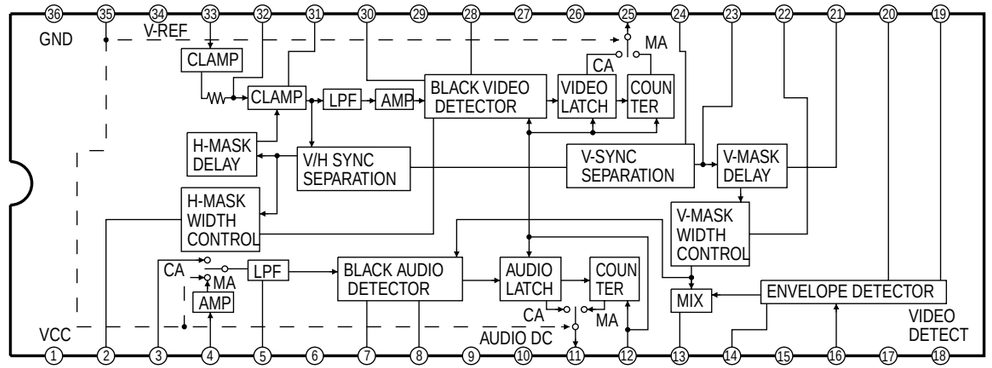
NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT



IC3801 COMMERCIAL ADVANCE PROCESS IC- DETAIL BLOCK DIAGRAM



LSJB2006
PV-V4612
MAIN VI (ADVANCE) SCHEMATIC DIAGRAM (D)

1. **Important safety notice**
   Components identified by the sign ⚠ have special characteristics important for safety. When replacing any of these components. Use only the specified parts.

2. Do not use the part number shown on this drawing for ordering.
   The correct part number and part value is shown in the parts list, and may be slightly different or amended since this drawing was prepared.

3. Use only original replacement parts:
   To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

4. Parts different in shape or size may be used.
   However, only interchangeable parts will be supplied as service replacement parts.

5. Test point information
   ● : Test point with a jumper wire across a hole in P.C.B.
   ○ : Test point with no test pin.

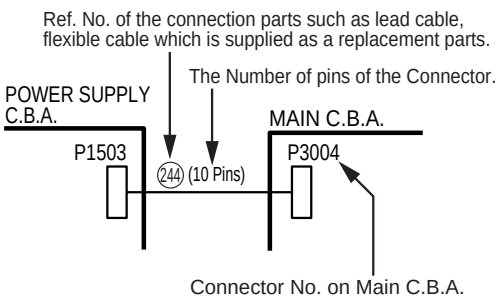
Schematic Diagram Notes

1. Indication for Zener Voltage of Zener Diodes
   The Zener Voltage of Zener Diodes are indicated as such on Schematic Diagrams.

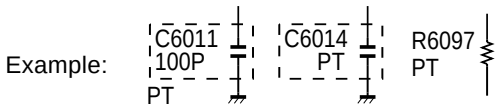
   Example:
   (6.2V).....Zener Voltage

2. How to identify Connectors
   Each connector is labeled with a Connector No. and Pin No. Indicating what it is connected to,
   in other words, its counter part.
   Use the interconnection schematic diagram to find the connection between associated connectors.

   Example:
   The connections between C.B.A.s are shown below.


Ref. No. of the connection parts such as lead cable, flexible cable which is supplied as a replacement parts.
The Number of pins of the Connector.
POWER SUPPLY C.B.A.
MAIN C.B.A.
P1503
244 (10 Pins)
P3004
Connector No. on Main C.B.A.

3. Parts marked "PT" are not used in any models included in this service model.

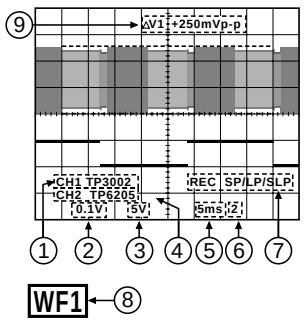


4. The part number shown on this drawing is only main part number, except for safety parts. Be sure to make your orders of replacement parts according to the parts list.

5. Jumper wires are used for WA10, WA5 etc and these are not supplied as replacement parts.

Signal Waveform Note

How to read Signal Waveform



① Connecting Point
② Volts/Div
③ Volts/Div
④ Connecting Point
⑤ Time/Div
⑥ Trigger Channel of the scope
(1:CH1,2:CH2)
⑦ Operation Mode of VCR
⑧ Waveform Point on Schematic
⑨ ΔV1:Peak to Peak

Circuit Board Layout Note

Circuit Board Layout shows components installed for various models.
For proper parts content for the model you are servicing, please refer to the schematic diagram and parts list.

NOTE:
Circuit Board Layout includes components which are not used.

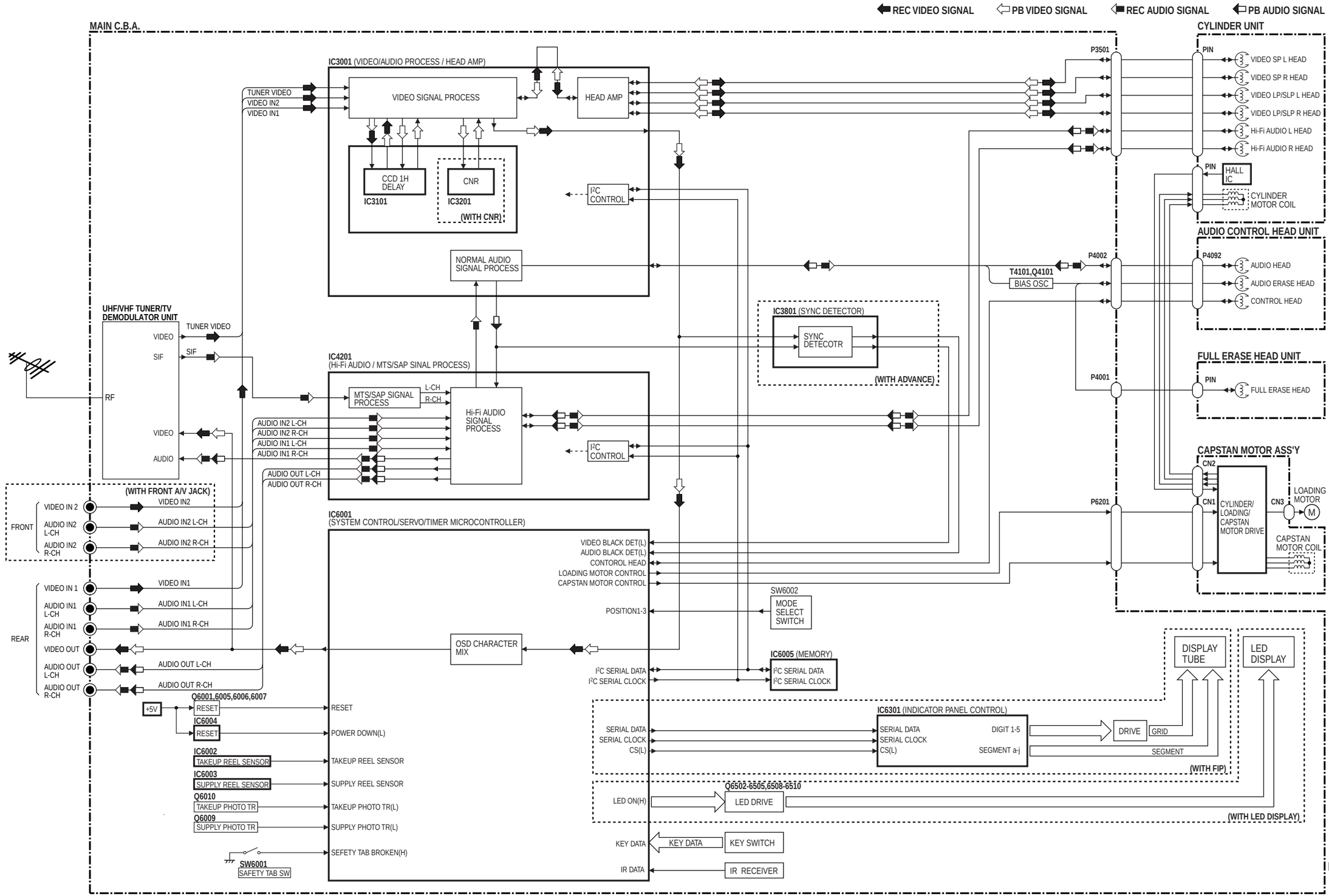
Model No. Identification Mark

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D
Not used	PT

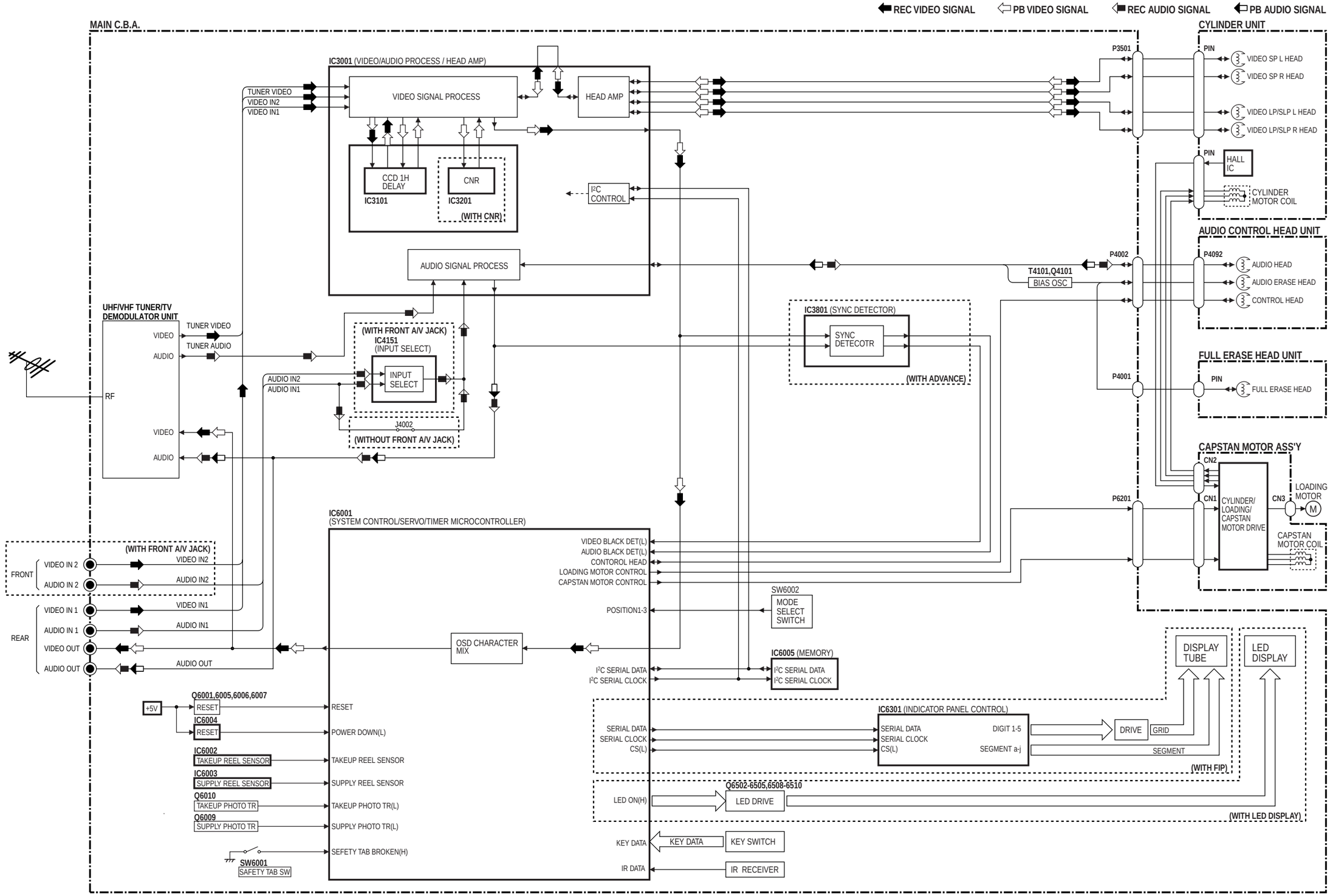
Note : Refer to item 3 of Schematic Diagram Notes for mark "PT".

OVERALL BLOCK DIAGRAM



PV-V4522, PV-V4612
OVERALL BLOCK DIAGRAM

OVERALL BLOCK DIAGRAM



PV-V402, PV-V4022
OVERALL BLOCK DIAGRAM

MAIN C.B.A. LSEP2006GB (A) / LSEP2006GA (B) / LSEP2006HA (C) / LSEP2006HC (D)

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE 1.6A 125/250V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES
D'T INCENDIE N'I UTILISERQUE DES FUSIBLE DE MÉME
TYPE 1.6A 125/250V

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,
USE ONLY THE SPECIFIED PARTS.

NOTE:
CIRCUIT BOARD LAYOUT SHOWS COMPONENTS INSTALLED FOR VARIOUS MODELS.
FOR PROPER PARTS CONTENT FOR THE MODEL YOU ARE SERVICING,
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST.

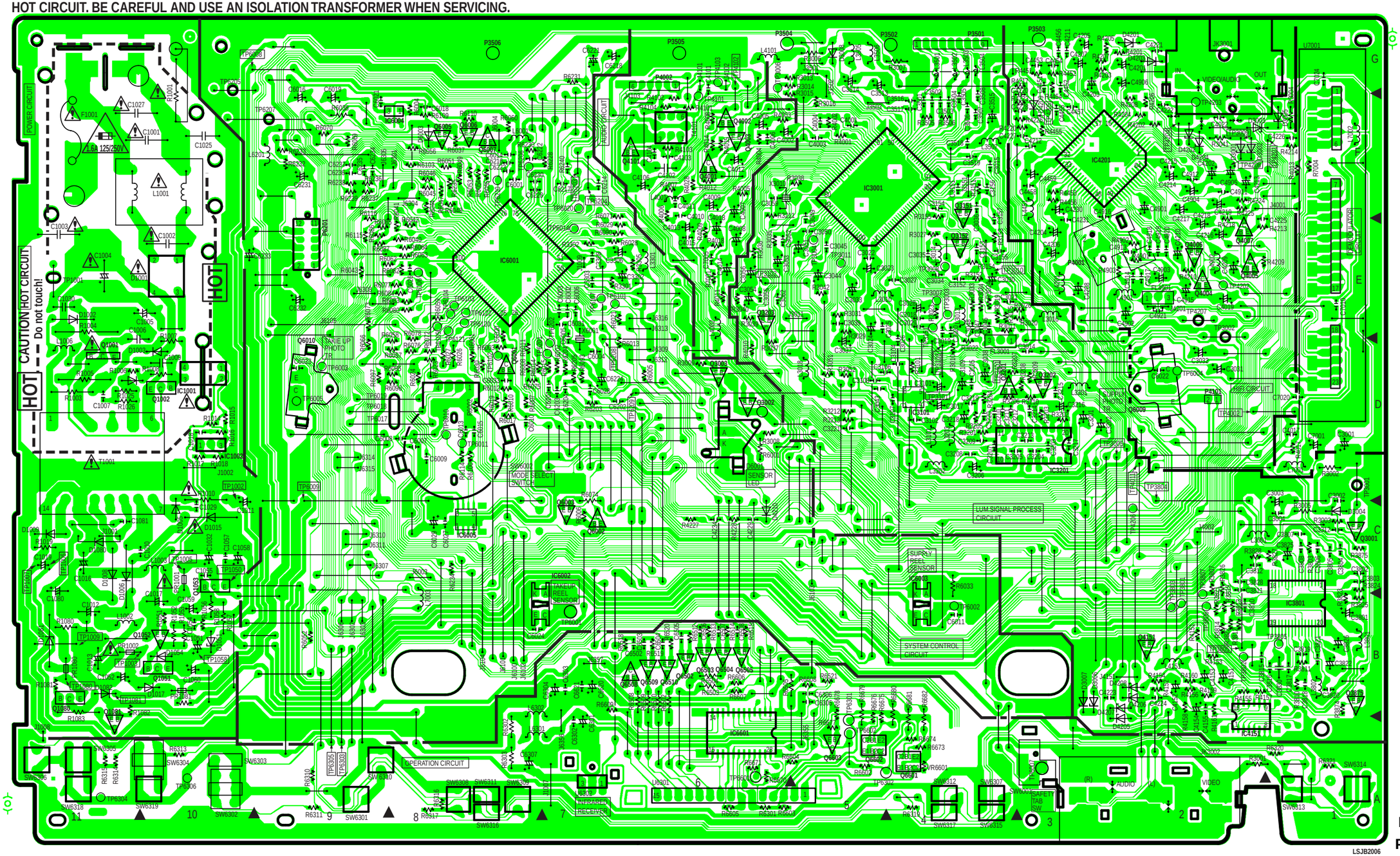
NOTE:
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART
OF MODELS & MARKS

MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D

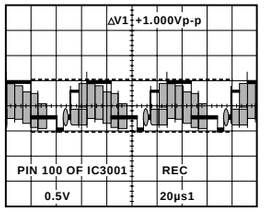
HOT CIRCUIT. BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.



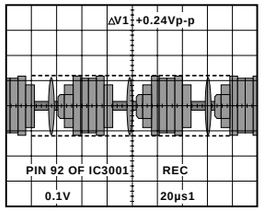
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART
OF MODELS & MARKS

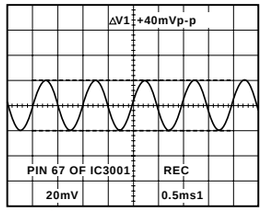
MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D



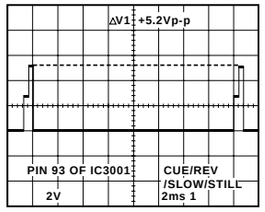
WF1



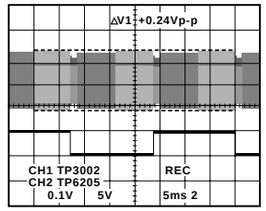
WF6



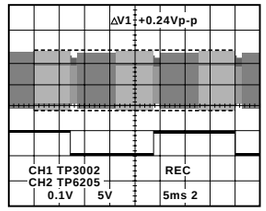
WF9



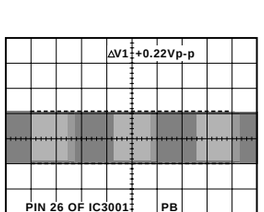
WF14



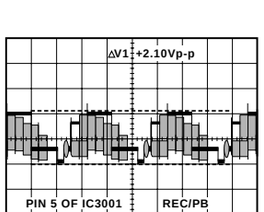
CH1 WF17 (A, B)
CH2 WF21 (A, B)



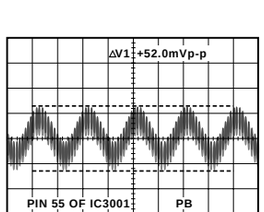
CH1 WF17 (C, D)
CH2 WF21 (C, D)



WF2

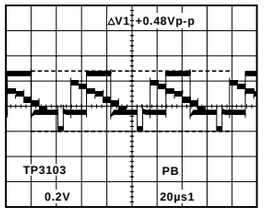


WF6

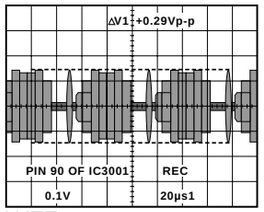


WF10

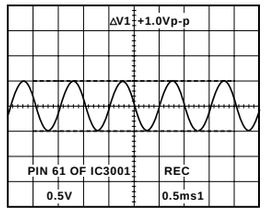
WF15



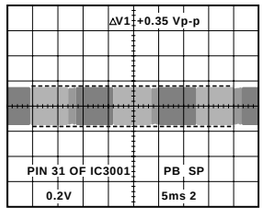
WF3



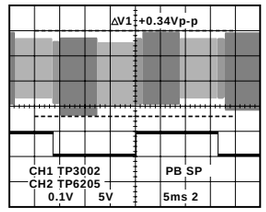
WF7



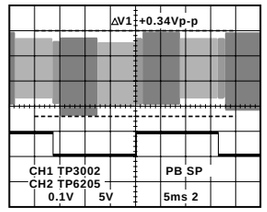
WF11



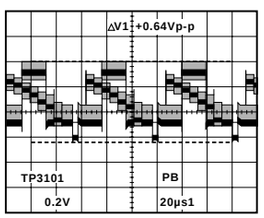
WF15



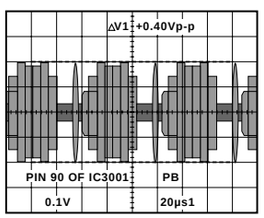
CH1 WF17 (A, B)
CH2 WF21 (A, B)



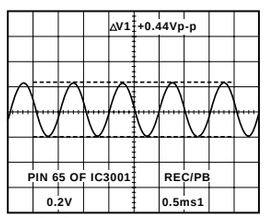
CH1 WF17 (C, D)
CH2 WF21 (C, D)



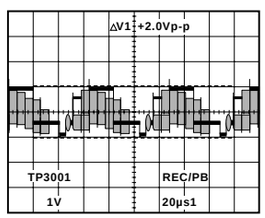
WF4



WF7



WF12

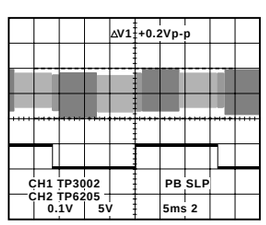


WF16

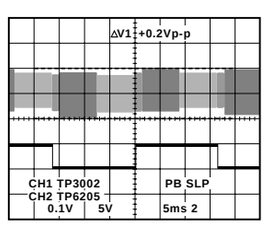
WF5

WF8

WF13



CH1 WF17 (A, B)
CH2 WF21 (A, B)



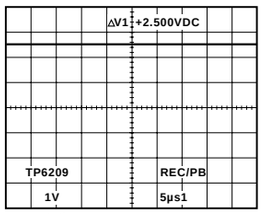
CH1 WF17 (C, D)
CH2 WF21 (C, D)

WAVE FORM PV-V402, PV-V4022, PV-V4522, PV-V4612

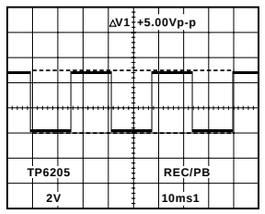
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART
OF MODELS & MARKS

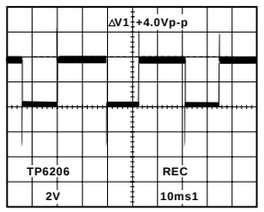
MODEL	MARK
PV-V402	A
PV-V4022	B
PV-V4522	C
PV-V4612	D



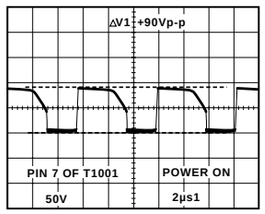
WF18



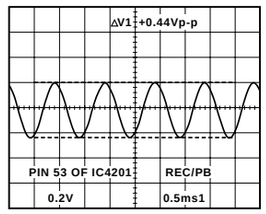
WF21



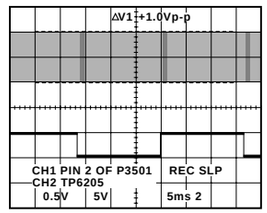
WF24



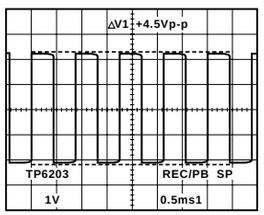
WF28



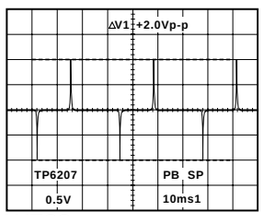
WF33 (C, D)



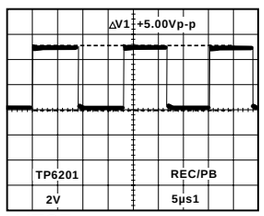
CH1 WF37
CH2 WF21



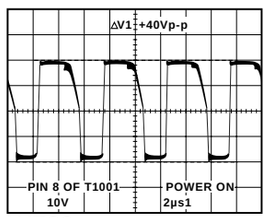
WF19



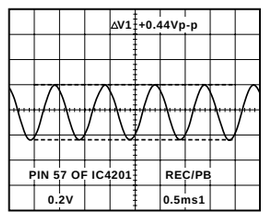
WF22



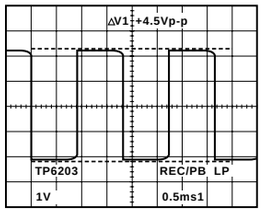
WF25



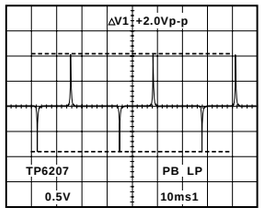
WF29



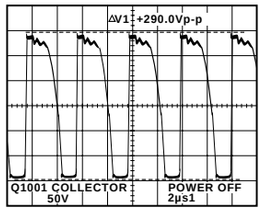
WF34 (C, D)



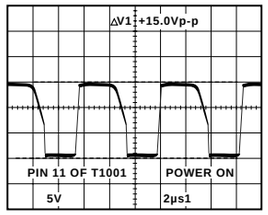
WF19



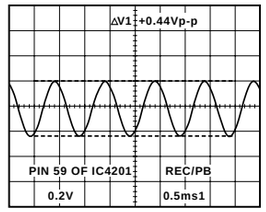
WF22



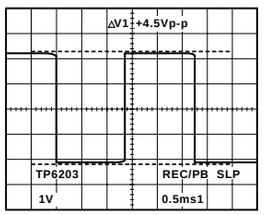
WF26



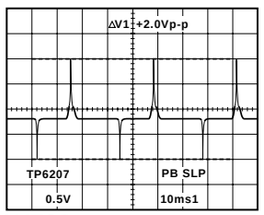
WF30



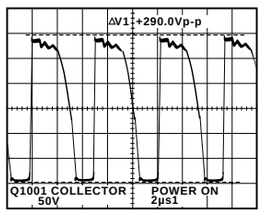
WF35 (C, D)



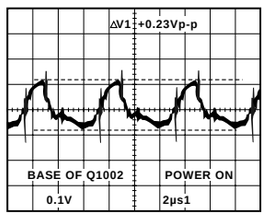
WF19



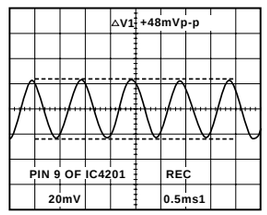
WF22



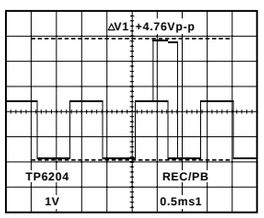
WF26



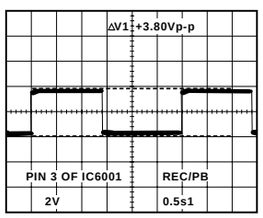
WF31



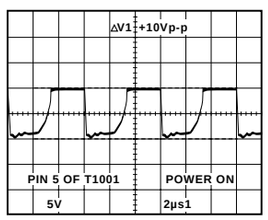
WF36 (C, D)



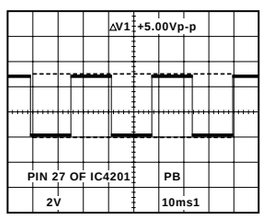
WF20



WF23



WF27



WF32 (C, D)